Service Manual

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MTNC040418C1

B19 Canada: B05

Service Manual

Color Television

- CT-32HL44J
  CT-32HL44UJ

GN1

Panasonic®

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by ⚠ in the Schematic Diagrams, Circuit Board Diagrams, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without permission of manufacturer.

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1 Safety precautions

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General guidelines

An isolation transformer should always be used during the servicing of a receiver whose chassis is not isolated from AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injuryfrom electrical shocks. It will also protect the receiver from being damaged by accidental shorting that may occur during servicing.

When servicing, observe the original lead dress, especially in the high voltage circuit. Replace all damaged parts (also parts that show signs of overheating.)

Always replace protective devices, such as fish paper, isolation resistors and capacitors, and shields after servicing the receiver. Use only manufacturer s recommended rating for fuses, circuits breakers, etc.

High potentials are present when this receiver is operating. Operation of the receiver without the rear cover introduces danger for electrical shock. Servicing should not be performed by anyone who is not thoroughly familiar with the necessary precautionswhen servicing high voltage equipment.

Extreme care should be practiced when handling the picture tube. Rough handling may cause it to implode due to atmospheric pressure. (14.7 lbs per sq. in.). Do not nick or scratch the glass or subject it to any undue pressure. When handling, usesafety goggles and heavy gloves for protection. Discharge the picture tube by shorting the anode to chassis ground (not to the cabinet or to other mounting hardware). When discharging connect cold ground (i.e. dag ground lead) to the anode with a wellinsulated wire or use a grounding probe.Avoid prolonged exposure at close range to unshielded areas of the picture tube to prevent exposure to x ray radiation.

The test picture tube used for servicing the chassis at the bench should incorporate safety glass and magnetic shielding. The safety glass provide shielding for the tube viewing area against x ray radiation as well as implosion. The magnetic shieldlimits the x ray radiation around the bell of the picture tube in addition to the restricting magnetic effects. When using a picture tube test jig for service, ensure that the jig is capable of handling 50kV without causing x ray radiation.

Before returning a serviced receiver to the owner, the service technician must thoroughly test the unit to ensure that is completely safe to operate. Do not use a line isolation transformer when testing.

Leakage current cold check

Unplug the A.C. cord and connect a jumper between the two plug prongs.Measure the resistance between the jumpered AC plug and expose metallic parts such as screwheads, antenna terminals,

control shafts, etc. If the exposed metallic part has a returnpath to the chassis, the reading should be between 240kΩ and 5.2MΩ. If the exposed metallic part does not have a return path to the chassis, the reading should be infinite.

Leakage current hot check

Plug the AC cord directly into the AC outlet. Do not use an isolation transformer during the check.

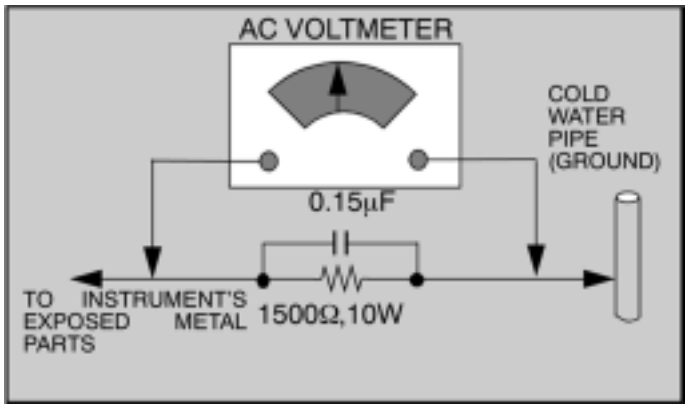
Connect a 1.5kΩ 10 watt resistor in parallel with a 0.15μF capacitor between an exposed metallic part and ground. Use earth ground, for example a water pipe.

Using a DVM with a 1000 ohms/volt sensitivity or higher, measure the AC potential across the resistor.

Repeat the procedure and measure the voltage present with all other exposed metallic parts.

Verify that any potential does not exceed 0.75 volt RMS. A leakage current tester (such a Simpson model 229, Sencore model PR57 or equivalent) may be used in the above procedure, in which case any current measure must not exceed 0.5 milliamp. Ifany measurement is out of the specified limits, there is a possibility of a shock hazard and the receiver must be repaired and rechecked before it is returned to the customer.

Hot check circuit



Insulation test

Connect an insulation tester between an exposed metallic part and A.C. line. Apply 1500VAC/60Hz for 1 second. Confirm that the current measurement is 0.5mA ~ 2.0mA. Repeat test with other metallic exposed parts.

X ray radiation

WARNING

The potential source of x ray radiation in the TV set is in the high voltage section and the picture tube.

NOTE

It is important to use an accurate, calibrated high voltage meter.

Set the brightness, picture, sharpness and color controls to minimum.

Measure the high voltage. With a 480i signal the high voltage should be 31.0kV ± 0.3kV and with a 1080i signal the high voltage should be 31.0kV ± 0.3kV. If the upper limit is out of tolerance, immediate service and correctionis required to insure safe operation and to prevent the possibility of premature component failure.

Horizontal oscillator disable circuit test

This test must be performed as a final check before the receiver is returned to the customer. See horizontal oscillator disable circuit procedure check in this manual.

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2 Service notes

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NOTE

These components are affixed with glue. Be careful not to break or damage any foil under the component or at the pins of the ICs when removing. Usually applying heat to the component for a short time while twisting with tweezers will break the component loose.

Leadless chip component (surface mount)

Chip components must be replaced with identical chips due to critical foil track spacing. There are no holes in the board to mount standard transistors or diodes. Some chips capacitor or resistor board solder pads may have holes through the board,however the hole diameter limits standard resistor replacement to 1/8 watt. Standard capacitor may also be limited for the same reason. It is recommended that identical components be used.

Chip resistor have a three digit numerical resistance code, 1st and 2nd significant digits and a multiplier. Example: 162 = 1600 or 1.6kΩ resistor, 0 = 0Ω (jumper).

Chip capacitors generally do not have the value indicated on the capacitor. The color of the component indicates the general range of the capacitance.

Chip transistors are identified by a two letter code. The first letter indicates the type and the second letter, the grade of transistor.

Chip diodes have a two letter identification code as per the code chart and are a dual diode pack with either common anode or common cathode. Check the parts list for correct diode number.

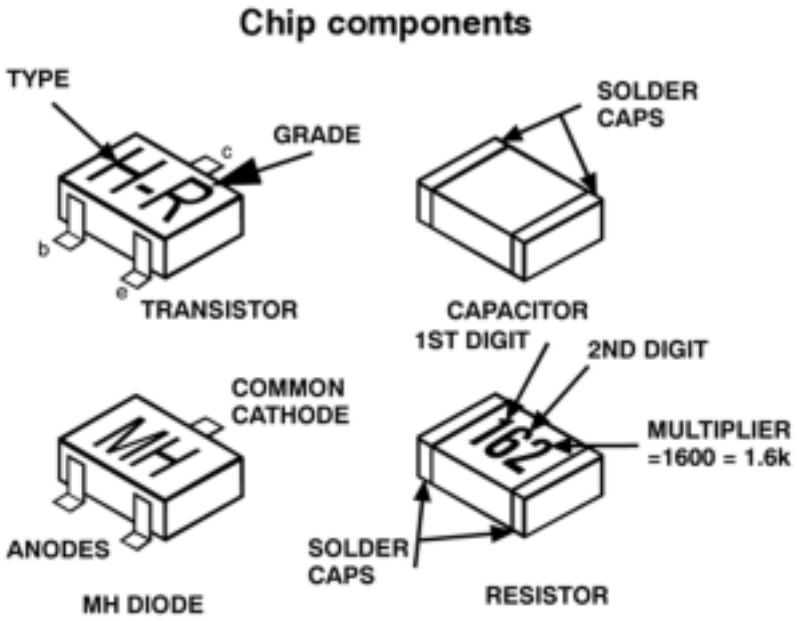
Component removal

1. Use solder wick to remove solder from component end caps or terminal.
2. Without pulling up, carefully twist the component with tweezers to break the adhesive.
3. Do not reuse removed leadless or chip components since they are subject to stress fracture during removal.

Chip component installation

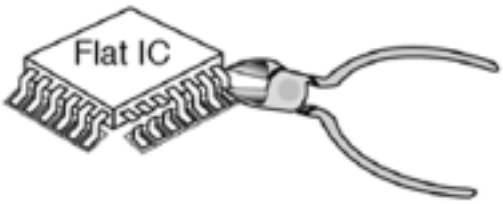
1. Put a small amount of solder on the board soldering pads.

2. Hold the chip component against the soldering pads with tweezers or with a miniature alligator clip and apply heat to the pad area with a 30 watt iron until solder flows. Do not apply heat for more than 3 seconds.

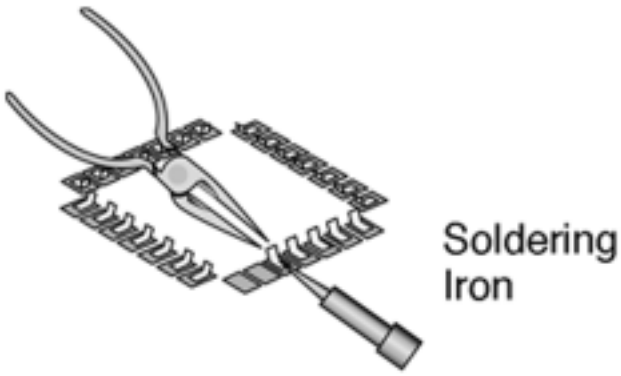


How to replace flat ic (required tools)

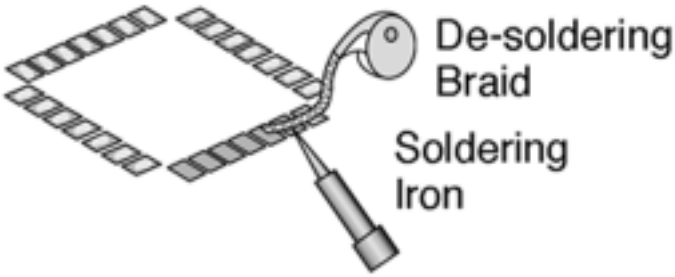
1. Remove the solder from all of the pins of a Flat IC by using a desolder braid



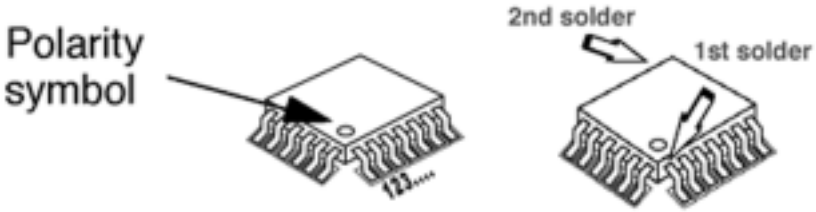
2. Put the iron wire under the pins of the Flat IC and pull it in the direction indicated while heating the pins using a soldering iron. A small awl can be used instead of the iron wire.



3. Remove the solder from all the pads of the Flat IC by using a de solder braid



4. Position the new Flat IC in place (apply the pins of the Flat IC to the soldering pads where the pins need to be soldered). Properly determine the positions of the soldering pads and pins by correctly aligning the polarity symbol



5. Solder all pins to the soldering pads using a fine tipped soldering iron

6. Check with a magnifier for solder bridge between the pins or for dry joint between pins and soldering pads. To remove a solder bridge, use a de solder braid as shown in the figure below

IMPORTANT

To protect against possible damage to the solid state devices due to arching or static discharge, make certain that all ground wires and CRT DAG wire are securely connected.

CAUTION

The power supply circuit is above earth ground and the chassis cannot be polarized. Use an isolation transformer when servicing the receiver to avoid damage to the test equipment or to the chassis.

Connect the test equipment to the proper ground(hot) or (cold) when servicing, or incorrect voltages will be measured.

WARNING

This receiver has been designed to meet or exceed applicable safety and x-ray radiation protection as specified by government agencies and independent testing laboratories.

To maintain original product safety design standards relative to x-ray radiation and shock and fire hazard, parts indicated with the symbol on the schematic must be replaced with identical parts. Order parts from the manufacturer s partscenter using the parts numbers shown in this service manual, or provide the chassis number and the part reference number.

For optimum performance and reliability, all other parts should be replaced with components of identical specification.

HORIZONTAL OSCILLATOR DISABLE CIRCUIT

This chassis employs a special circuit to protect against excessive high voltage and beam current. If, for any reason, the high voltage and beam current exceed a predetermined level this protective circuit activates and detunes the horizontal oscillatorthat limits the high voltage. The over-voltage protection circuit is not adjustable. However, if components indicated by the symbol on the schematic in either the horizontal sweep system or the over-voltage protection circuit itself are changed, theoperation of the circuit should be checked using the following procedure:

Equipment needed to check the disabled circuit:

1. High voltage meter (0 ~ 50kV)
2. Variac or isolation transformer
3. D.C. current meter
4. Digital voltmeter

PREPARATION

1. Connect receiver to A.C. 120 Volts. Do not turn ON.
2. Connect HIGH VOLTAGE meter to 2nd anode (H.V. button).

   NOTE

   Use cold ground for negative lead.

3. Connect the ammeter serial from the flyback anode lead to the picture tube anode socket.

PROCEDURE

1. Confirm that beam current is 2.4_mA.
2. Adjust VR524 so that high voltage is 31.0 ± 0.3kV.
3. Adjust VR538 so that digital meter reads 2.3 ± 0.05V
4. Apply a black pattern
5. Confirm that high voltage protector (SOS) operates at 38.5kV or less by adjusting VR524.
6. Turn VR524 counter clockwise, turn tv on and apply a white pattern.
7. Adjust VR524 so that high voltage meter reads 31.0 ± 0.3kV
8. Once the adjustment is completed, apply a bond on VR538 and VR538. Confirm B+ 142V ± 6.0V with 120V A.C. applied.

   NOTE

   If high voltage is not within the specified limit the cause must be determined before the receiver is returned to the owner.

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3 About lead free solder (PbF)

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NOTE

Lead is listed as (Pb) in the periodic table of elements.
In the information below, Pb will refer to lead solder, and PbF will refer to Lead Free Solder.
The lead free solder used in our manufacturing process and discussed below is (Sn+Ag+Cu).
Thatis Tin (Sn), Silver (Ag) and Copper (Cu) although other types are available.

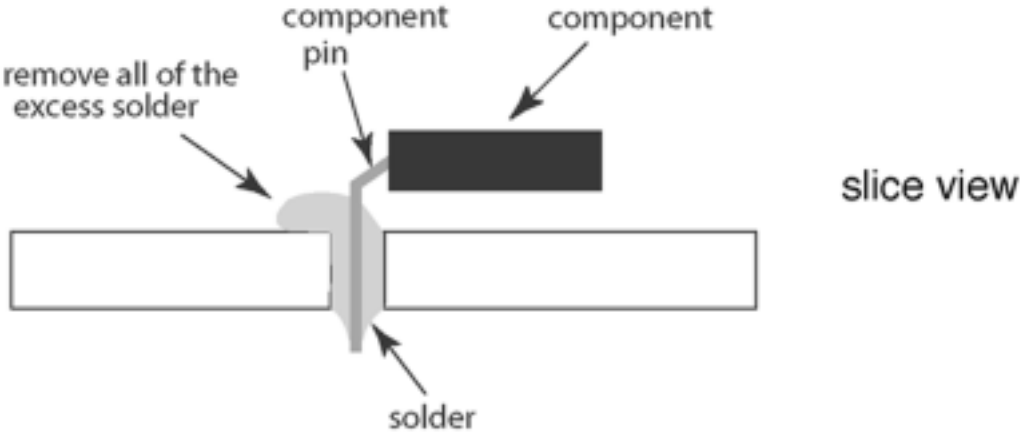
This model uses Pb Free solder in it s manufacture due to environmental conservation issues. For service and repair work, we d suggest the use of Pb free solder as well, although Pb solder may be used.
PCBs manufacturedusing lead free solder will have the PbF or a leaf symbol stamped on the back of PCB.

CAUTION

- Pb free solder has a higher melting point than standard solder. Typically the melting point is 50 ~ 70 °F (30 ~ 40 °C) higher. Please use a high temperature soldering iron and set it to 700 ± 20 °F (370 ± 10 °C).

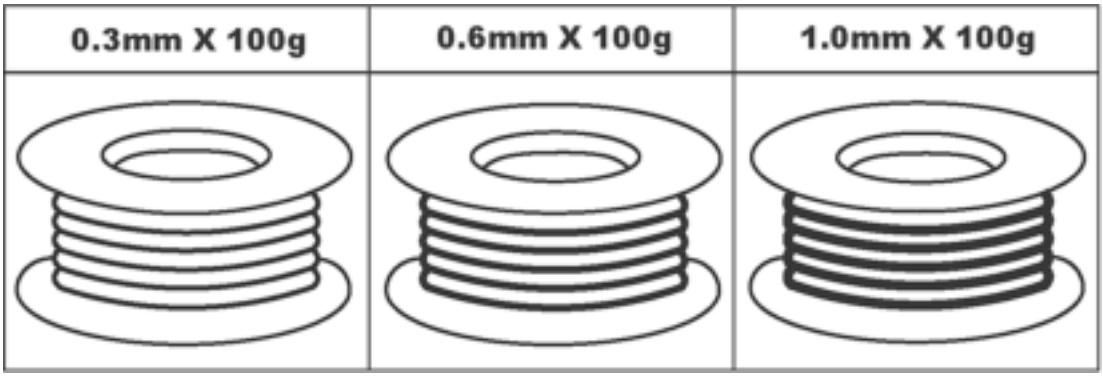
- Pb free solder will tend to splash when heated too high (about 1100 °F or 600 °C).
  If you must use Pb solder, please completely remove all of the Pb free solder on the pins or solder area before applying Pb solder. If thisis not practical, be sure to heat the Pb free solder until it melts, before applying Pb solder.

- After applying PbF solder to double layered boards, please check the component side for excess solder which may flow onto the opposite side.



Suggested Pb free solder

There are several kinds of Pb free solder available for purchase. This product uses Sn+Ag+Cu (tin, silver, copper) solder. However, Sn+Cu (tin, copper), Sn+Zn+Bi (tin, zinc, bismuth) solder can also beused.



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4 Receiver feature table

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FEATURE/MODEL	CT-32HL44J/UJ
CHASSIS	BP418
MICRO	256K
MENU LANGUAGE	ENG/SPAN/FR
CLOSE CAPTION	X
V-CHIP (USA/CANADA	X
CHANNEL INFO BANNER	X
VIDEO INPUT SKIP	SKIP
CHANNEL COUNT	181
PIP (1T), 2T PIP (2T), 2T SPLIT	2T SPLIT
REMOTE CONTROL (W/LIGHT)	EUR7603ZF0
CRT SUPPLIER	MDDA PF SST
FAMILY	GN1
COMB FILTER	MOTION ADP, 3DY/C
HEC/VEC (X=BOTH)	X
VM	X (SELECTABLE)
V/A NORM (X=BOTH)	X
COLOR TEMP	X
AIP	X
PRESET/INPUT LABELING	X
VIDEO PICTURE MEMORY	X
DIGITAL SCAN RATE	1080i, 480p
NTSC LINE DOUBLER	480p PROGRESSIVE
MTS/SAP/DBX	X
BUILT-IN AUDIO POWER	15W X 2
No. OF SPEAKERS	2
BASS/BALANCE/TREBLE CONTROL	X
AI SOUND	X
SURROUND	X
SPATIALIZER/BBE	BBE
A/V IN (REAR/FRONT)	4(3/1)
PROGRAM OUT	X
AUDIO OUT (FAO: F, VAO:V)	F, V
COMPONENT INPUT (Y, Pb, Pr)	2

S-VHS INPUT (REAR/FRONT)	2/1
HDMI/HDCP INPUT	X
WEIGHT (KG/LB)	98KG/216LB
DIMENSIONS (W/D/H) mm	1094.0/742/891

Note:

Specifications are subject to change without notice or obligation. Dimensions and weights are approximate.

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5 Board description table

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BOARD	CT-32HL44J/UJ	DESCRIPTION
A-BOARD	TNP2AH061AD	MAIN CHASSIS
D-BOARD	TNP2AH062AD	HIGH VOLTAGE AND DEFLECTION
DG-BOARD	TNP2AA173AD	DIGITAL VIDEO
DF-BOARD	TNP2AA172AB	DYNAMIC FOCUS
H-BOARD	TNP2AA174AB	REAR A/V
L-BOARD	TNP2AA169	CRT BOARD
K-BOARD	TNP2AA171AD	KEY BOARD
G-BOARD	TNP2AA170AD	FRONT A/V

NOTE

When ordering a replacement board assembly, append an S to the board number

EXAMPLE

To order the A Board, the replacement board is TNP2AH061ADS

NOTE:

The DG-Board is non-serviceable. If this board is defective, replace it with a new board.

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6 TV Location of controls

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Quick reference control operation	
1	**Power** - Press to turn ON or OFF.
2	**Volume** - Press to adjust sound level, or to adjust audio menus, video menus, and select operating features when menus are displayed.
3	**Channel** - Press to select programmed channels. Press to highlight desired features when menus are displayed. Also use to select cable converter box channels after programming remote control infra-red codes (the TV/VCR/CABLE switch must be set in CABLE position).
4	**Action** - Press to display main menu and access on screen feature and adjustment menus.
5	**TV/Video** - Press to select TV or one of the video inputs.

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7 Location of controls (EUR7603ZF0 remote)

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POWER
Press to turn ON and OFF.
TV - VCR - DBS/CBL - DVD
Press to select a component.
MUTE
Press to mute sound.
TV/VIDEO
Press to select TV, Video mode.
MENU
Press to select TV, Video mode.
KEYBOARD
Press to select any channel.
R-TUNE
Press to switch to previously viewed channel or video mode.
SAP
Press to acces the secondary audio program broadcast.
CH
Press to select next or previous channel and navigate in menus.
VOL
Press to adjust TV sound and navigate in menus.
RECALL
Press to display time, channel sleep timer and other options.
GUIDE
DBS and DVD functions button.
EXIT
DBS menu function button.
PROG
Press for delimiter between major and minor channel number.
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Note:

For additional information about this remote please refer to the owner s manual section remote operation, listed on the parts list section.

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8 Auto diagnosis feature

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This receiver incorporates a new self diagnosis feature. With this new feature will be easier for the technician to detect the failures. There is a LED located by the keyboard on the front panel, this LED will start flashing when a failure is detectedby the circuits located in specific areas, depending on how many times the LED is flashing, this will tell you what circuit should be checked. Make a count of flashing and see the table shown below. Please use this feature effectively especially forintermittent problems.

SOS of front LED

FLASHES	POSSIBLE CIRCUIT	SOS
1	POWER+140	140 OCP
2	LOW B+ D.C.	SOS 2
4	HI VOLTAGE HHS	HHS
5	IC4511	GC2M
6	IC4518	GC2S
8	AUDIO AMP	SOS 4

AFTER THE COUNT

Proceed to check that area, verify what board is the problem located, this way the area to check will be reduced until the failure is found.

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9 EEPROM copy jig

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This CTV has a feature that allows to clone or back-up main EEPROM data adjustments from a CTV to other by connecting a jig to the CTV set. A jig part number TXFJIG02SER, is available through Matsushita/Panasonic Services.

Preparation:

To connect this jig, remove the lower back cover as instructed on disassembly for service section on this service manual and insert the jig into A15 connector located on the A-Board.

Procedure to copy data:

1. Enter to service mode and display service menu.
2. Select AREA DAC and then press ACTION button on remote to enter. Press VOL right/left to select one of the following options then press ACTION:
    - Select ALL to copy all main EEPROM data
    - Select ADJ to copy only adjustment data.
    - Select FIX to copy only fix data
3. To copy data from main EEPROM to jig, select IN→EX DAC and press ACTION button on remote.
4. To copy data from jig to main EEPROM, select EX→IN DAC and press ACTION button on remote.

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10 Dissasembly for service

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Back cover

Remove all the screws marked with an arrow (←) from the back of the receiver

NOTE

Screw configuration, type, and number of screws vary depending on the model of the receiver serviced and the application; various models are covered in this manual. Use same hardware when reassembling the receiver.

- 4 screws at the top edge of the receiver.
- screws by the A/V cover.
- 1 screw at the lower part of TV.
- 1 screw at each lower corner of the receiver.

NOTE

Extensions for board connectors may be needed to take voltages on some boards, please see parts list section for part numbers in this service manual.

A-Board - Main chassis

The A-Board assembly rest on a chassis tray along with the D-Board.

Slide chassis tray out. Gently lift the tray and pull out. Disconnect plug connectors; release wire ties and holders as required for complete chassis removal.

1. A-Board is secured to the chassis tray with screws.
2. The A-Board is mated to the D-Board by flexible connectors and to G-Board: A6, A7 & A8 (D6, D7 & D8 on the D-Board, respectively) and A1, A2 & A3 (G1, G2 & G3). To remove either boards, unplug the connectorson the A-Board.

   ### NOTE

Some tie-wraps that secure the wire dressings may need to be unfastened for chassis removal.

D-Board - Deflection

The D-Board assembly rest on a chassis tray along with the A-Board.

Slide chassis tray out. Gently lift the tray and pull out. Disconnect plug connectors; release wire ties and holders as required for complete chassis removal.

1. D-Board is secured to the chassis tray with screws.

2. The D-Board is mated to the A-Board and G-Board by flexible connectors: D6, D7 & D8 (A6, A7 & A7 on the A-Board, respectively) and D9 (G40 on the G-Board). To remove either boards, unplug the connectors.

   NOTE

   Some tie-wraps that secure the wire dressings may need to be unfastened for chassis removal

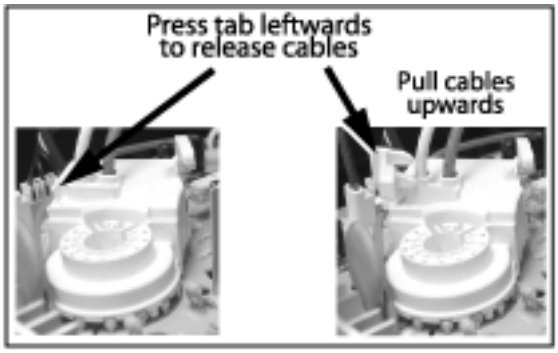
L-Board - CRT output

Plugs into the socket on the CRT neck.

To remove this board, first unplug the board from the CRT neck, then disconnect L1, L2 and L3 connectors, to disconnect the focus F1(red cable) & F2 (white cable) cables from the CRT socker, pull the tab and release the cables (see figure).Disconnect L10, L11, L12, L14 & L15 by inserting a wire in both holes then pull the cable out.

To reinsert back the cables, remember the original position of cables, F1 (red cable) goes to A on the CRT socket and F2 (white cable) goes to B on the CRT socket.

F1 and F2 cables release



DG-Board

The DG-Board is assembled on the main chassis (A-Board) plugged at the A13 and A14 (DG3 and DG4 respectively) connectors.

NOTE

This board is not-serviceable.
When removing this board pull carefully.

DF-Board

Plugs onto the right side of the D-Board at D14 and D16 connectors (P2, P11, P12 and P3 on P-Board, respectively); First remove the screw that holds the metal board, from the flyback and from the chassis tray and then use a flat head screwdriverto release the connector locking tabs and pull upwards the board.

G-Board

Mated to A-Board by three flexible connectors A1, A2, A3 and D9 from D-Board. To remove this board, first unplug the flexible connectors, then RT1 and G5 connectors, then pull upwards the board while unlock the tabs from the chassis tray.

Buttons assembly

This assembly is hold with two screws to the front cabinet. To remove, pull out the chassis and remove the two screws from each side of the assembly.

Speakers

Each speaker is secured to a plastic base with 4 screws, and the plastic base is secured to the from cabinet with three screws. To remove the small speaker from the plastic base, unscrew the four screws; To remove the bigger speaker, disassemblythe plastic base by removing the five screws from the back of the plastic base.

NOTE

When reassembling speakers be sure to connect the speaker wires to the correct speaker lead (+) (-)

10.1 Disassembly for CRT replacement

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10.1 Disassembly for CRT replacement

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1. Discharge the CRT as instructed in the safety precautions section and remove 2nd anode button from the CRT.

2. Remove speaker modules (R and L)

3. Perform complete removal of chassis, as instructed in disassembly for service section.

   NOTE

   When remounting the CRT, reuse the metal sheet located in the lower part of the cabinet holding the CRT, hold with screws to the cabinet. This metal sheet is not supplied with the CRT replacement.

CRT replacement

1. Perform disassembly for CRT replacement procedure.

2. Insure that the CRT H.V. Anode button is discharged before handling the CRT. Read the safety precautions section on handling the picture tube.

3. Remove the components from the CRT neck and place the cabinet face down on a soft pad.

4. Note the original order for the CRT mounting hardware as they are remove from the CRT mounting brackets at each corner of the CRT.

5. Remove the CRT with the degaussing coil and the dag ground braid attached.

6. Note the original locations and mounting of the degaussing coil and the dag ground assembly to insure proper reinstallation on the replacement CRT.

   To remove and remount the degaussing coil:

   - Unhook the coil spring from the bottom corners of the CRT ears.

   - Release the braid loop from the upper corners of the CRT ears.

7. Mount the dag ground braid on the replacement CRT. Position the degaussing coil with new ties.

Dress coil as was on the original CRT.

8. Replace the components on CRT neck and reinstall into cabinet. Verify that all ground wires and circuit board plugs get connected.

NOTE

Reuse all the clampers and mounting brackets from the degauss coil and screen, and when remounting the degauss coil assure that is not touching the speakers, this can be done by placing some tape, this may cause mask vibration. The mounting brackets andclampers are not supplied with the replacements.

IMPORTANT NOTICE

When ordering the CRT, please order CRT and CRT kit also. Please see parts list section for part numbers

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11 Back cover removal

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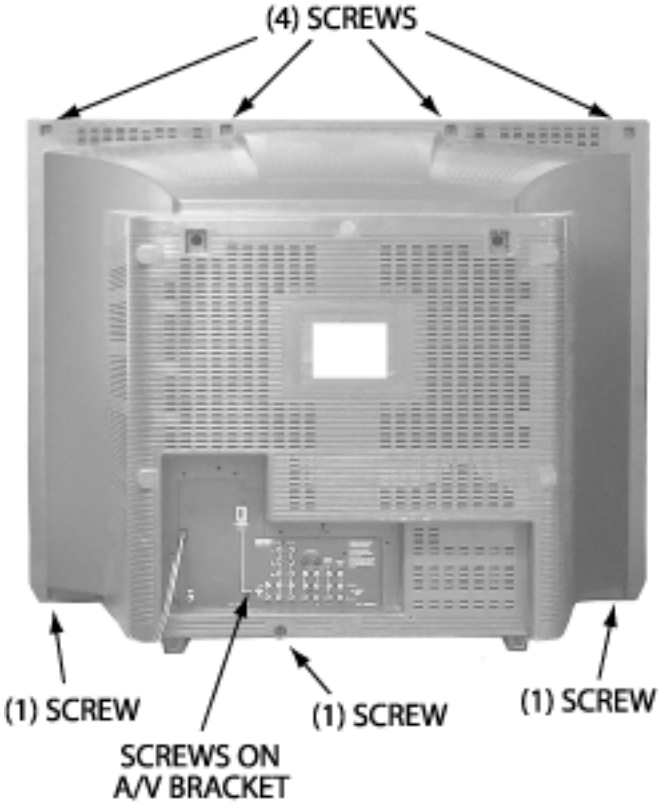

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12 Chassis service adjustment procedures

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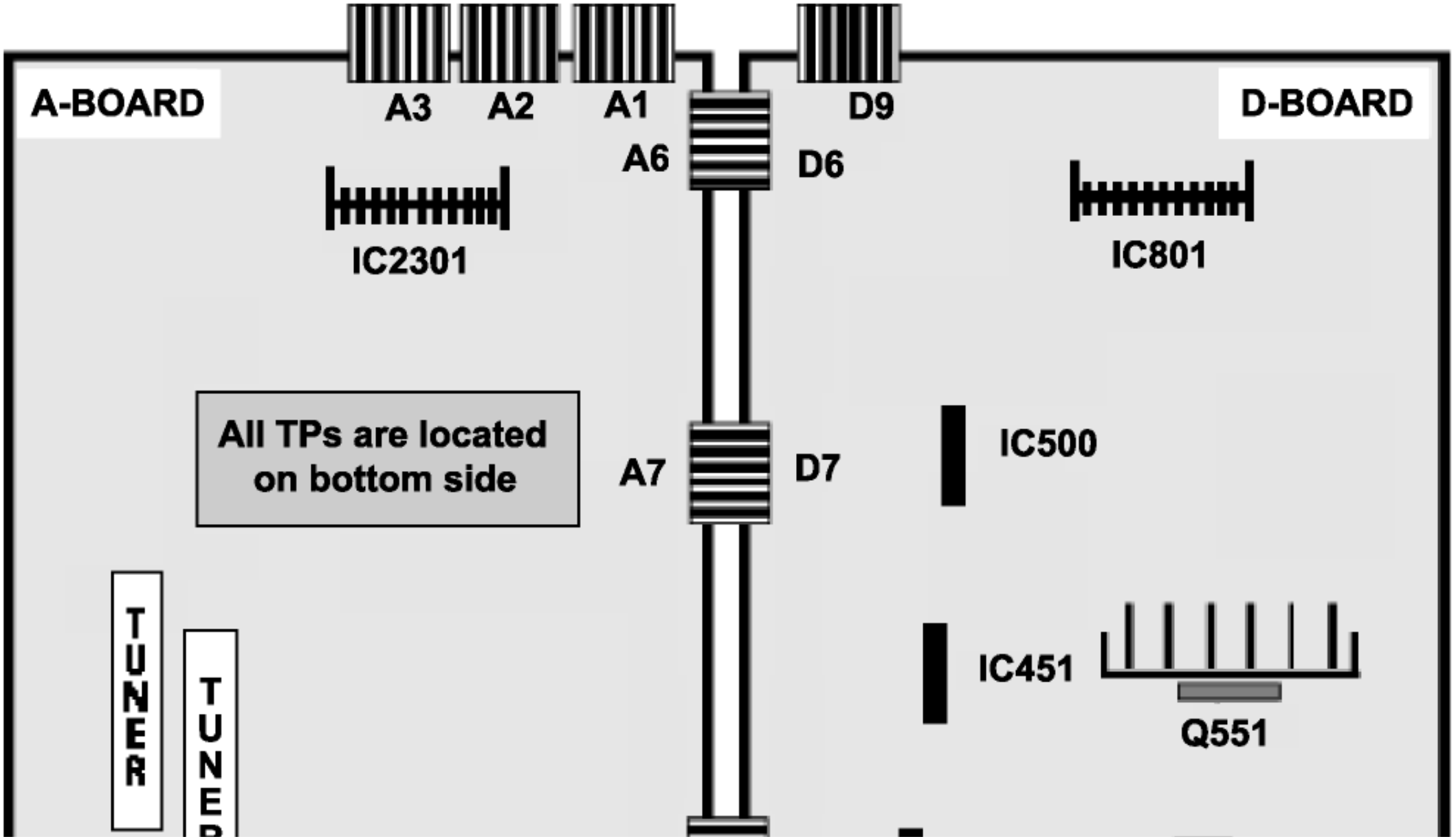
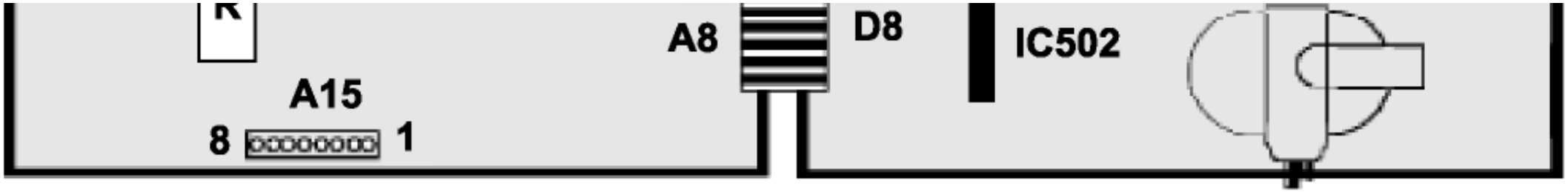
All service adjustments are factory preset and should not require change unless controls and/or associated components are replaced.





140.0_V B+ voltage check

1. Set the BRIGHT and PICTURE to minimum by using the PICTURE menu.
2. Connect the DVM on TPD50 (D-Board by and cold ground
3. Confirm that B+ voltage is 142V ± 6.0V. This voltage supplies B+ to the horizontal output and flyback circuits.

Source voltage chart

120V AC line input. Set the BRIGHT and the PICTURE to minimum by using the PICTURE menu. Use cold or hot ground for the (-) lead of the DVM as needed

A-BOARD	VOLTAGE
STBY 7V (BY IC2201) A-Board TPA9	7.5 ± 0.75V
MAIN 9V (BY IC006) A-Board TPA90	9.0V ± 0.5V
MAIN 5V (BY IC2301) A-Board TPA15	5.2V ± 0.3V
GC 2.5V (BY IC2856) A-Board TPA25	2.6V ± 0.2
STBY 3.3V (BY A13 CONNECTOR) A-Board TPA16	3.3V ± 0.2V
MAIN 3.3V (BY A21 CONNECTOR) A-Board TPA33	3.3V ± 0.2V
MAIN 1.8V (BY IC2451) A-Board TPA18	1.8V ± 0.2V

D-BOARD	VOLTAGE
+B2 (BYD14 CONNECTOR) D-Board TPD50	142.0 ± 6.0V
30V (BY IC807) D-Board TPD19	33.5 ± 2.0V
15V (BY IC802) D-Board TPD7	14.5 +1.5V -1.0
-15V (BY D9 CONNECTOR) D-Board TPD6	-15.5V ± 1.5V
SOUND+ (BY D6 CONNECTOR) D-Board TPD4	17.2V +1.5V -1.0
SOUND- (BY D6 CONNECTOR) D-Board TPD53	-16.2V +1.5V -1.0
210V (BY IC805) D-Board TPD34	211.0V ± 4.0V

MAIN 12V (BY D16 CONNECTOR) D-Board TPD22	12V ± 0.5V

High voltage check

1. Select an active TV channel and confirm that horizontal is in sync.
2. Adjust BRIGHTNESS and PICTURE using PICTURE icon menu so video just disappears.
3. Confirm B+ 142 ± 6.0V is within limit.
4. Using a high voltage meter confirm that the high voltage is 31.0kV ± 0.3kV

TOP PREVIOUS NEXT

13 Purity and convergence procedure

TOP PREVIOUS NEXT

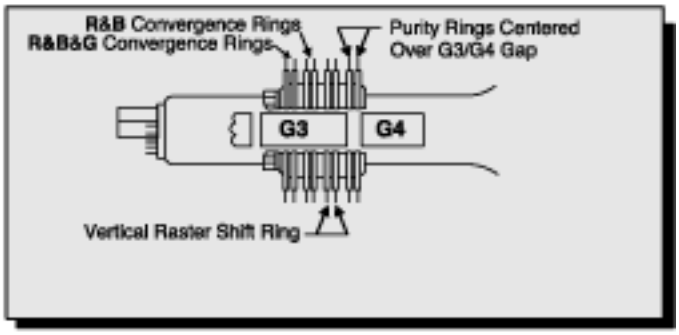
Adjustment is necessary only if the CRT or the deflection yoke is replaced or if the setting was disturbed. The complete procedure consists of:

1. Vertical raster shift adjustment.
2. Initial static convergence.
3. Setting the purity.
4. Final static convergence.

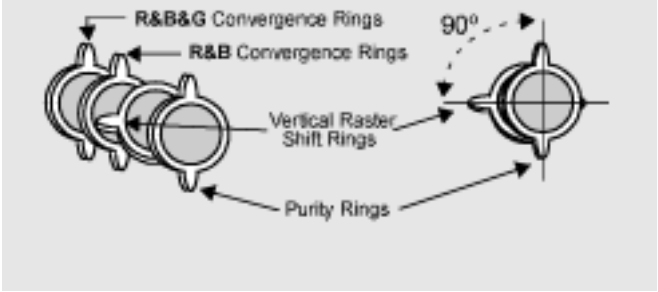
When the CRT or the yoke is replaced

Place the yoke on the CRT neck (do not tighten the clamp). Place the vertical raster shift tabs at 3 o clock (90° from the purity and convergence tabs

Description of rings



Initial position of rings



Turn the receiver ON. Operate the receiver for 60 minutes using the first purity check field (white screen) to stabilize the CRT.

Fully degauss the receiver by using an external degaussing coil.

Slide the deflection yoke back and forth on the neck of the CRT until it produces a near white, uniform raster.

VERTICAL RASTER SHIFT ADJUSTMENT

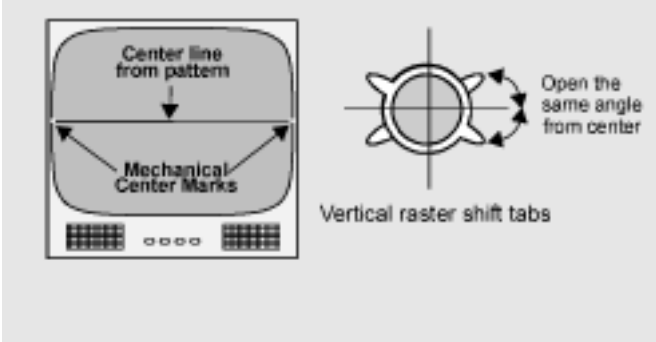
Apply a green pattern with a horizontal line, adjust the Deflection Yoke so that has no tilt, then secure it.

Adjust center line of the pattern with the mechanical center of the CRT, this center is determined by two marks at the side edges of the screen. To adjust the line, once the vertical raster shift tabs are place at 3 o clock to reduce itsmagnetic field effect open the tabs the same angle from the center, until the center line of the pattern becomes a straight line, centered with the marks of the CRT.

IMPORTANT NOTICE

Rings come along with deflection yoke in one piece.

Vertical raster shift adjustment



INITIAL CENTER STATIC CONVERGENCE

Connect a dot/cross hatch generator to the receiver and tune in a signal. Observe misconvergence at center of the screen only.

Adjust the R&B pole magnets; by separating tabs and rotating to converge blue with red.

Adjust the R&B and R&B&G pole magnets: by separating tabs and rotating to converge blue and red (magenta) with green.

NOTE

Precise convergence at this point is not important.

PURITY ADJUSTMENT

When the receiver is in the serviceman mode for making electronic adjustments, press the RECALL button on the remote control to enter purity check. (See the service adjustments electronic controls procedure).

Operate the receiver for 60 minutes using the first purity check field (white screen) to stabilize the CRT.

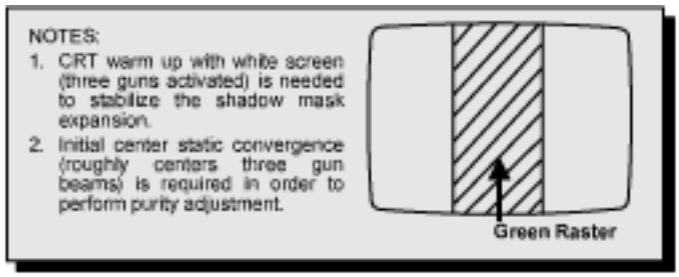
Fully degauss the receiver by using an external degaussing coil

Press the RECALL button on the remote control again until the purity check (green screen) appears.

Loosen the deflection yoke clamp screw and move the deflection yoke back as close to the purity magnet as possible.

Adjust the purity rings to set the vertical green raster precisely at the center of the screen

Green raster adjustment


NOTES:
1. CRT warm up with white screen (three guns activated) is needed to stabilize the shadow mask expansion.
2. Initial center static convergence (roughly centers three gun beams) is required in order to perform purity adjustment.
Green Raster

Slowly move the deflection yoke forward until the best overall green screen is displayed.

Tighten the deflection yoke clamp screw.

Press the RECALL button on the remote control again until the purity check blue and red screens appear and observe that good purity is obtained on each respective field.

Press the RECALL button on the remote control again until purity check (white screen) appears. Observe the screen for uniform white. If purity has not been achieved, repeat the above procedure.

FINAL CONVERGENCE PROCEDURE

NOTE

Vertical size and focus adjustments must be completed prior to performing the convergence adjustment. Connect a dot pattern generator to the receiver. The brightness level should not be higher than necessary to obtain a clear pattern.

Converge the red and the blue dots at the center of the screen by rotating the R&B pole static convergence magnets.

Align the converged red/blue dots with the green dots at the center of the screen by rotating the R&B&G pole static convergence magnets. Melt wax with soldering iron to fix the magnets.

Slightly tilt vertically and horizontally (do not rotate) the deflection yoke to obtain a good overall convergence.

If convergence is not reached at the edges, insert permalloy in the DY corners to achieve proper convergence. Recheck for purity and readjust if necessary.

After vertical adjustment of the yoke, insert wedge at 11 o clock position, then make the horizontal tilt adjustment.

Secure the deflection yoke by inserting four side wedges.

Apply adhesive between tab (thin portion) of wedge and CRT and place tape over the tab to secure to the CRT.

13.1 DYNAMIC CONVERGENCE ADJUSTMENT

13.2 Permalloy convergence corrector strip (Part No. 0FMK014ZZ)

13.3 DAF adjustment (Dynamic focus adjustment)

TOP PREVIOUS NEXT

13.1 DYNAMIC CONVERGENCE ADJUSTMENT

TOP PREVIOUS NEXT

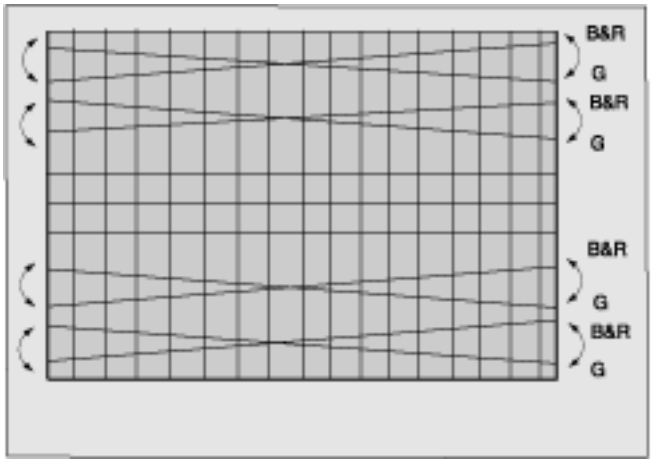
Use this for a precisely overall convergence adjust at the edges.

DY(YHC, YV, XV) ADJUSTMENT

YV ADJUSTMENT
(VR1 FOR HORIZONTAL DYNAMIC CONVERGENCE)

1. Apply a crosshatch pattern.
2. Adjust contrast and brightness customer controls to obtain a correct picture.
3. With a driver adjust VR1 (located in deflection yoke board to obtain a proper corvergence at top and bottom of the screen

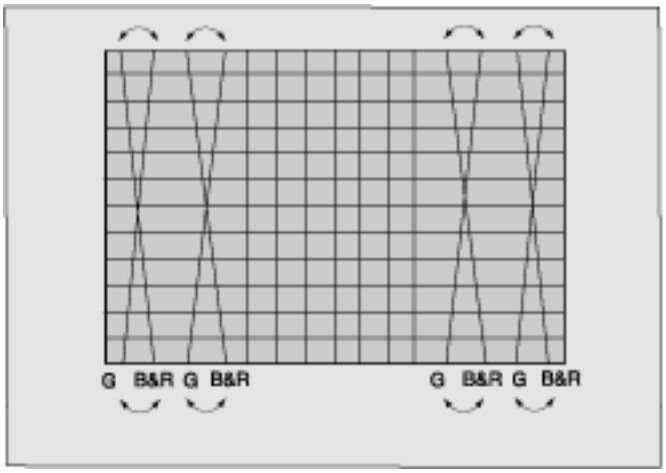
VR1 adjustment (YV)



YH Adjustment
(VR2 for vertical dynamic convergence)

1. Apply a crosshatch pattern.
2. Adjust contrast and brightness customer controls to obtain a correct picture.
3. With a driver Adjust VR2 (located in deflection yoke board to obtain a proper corvergence at left and right side of the screen.

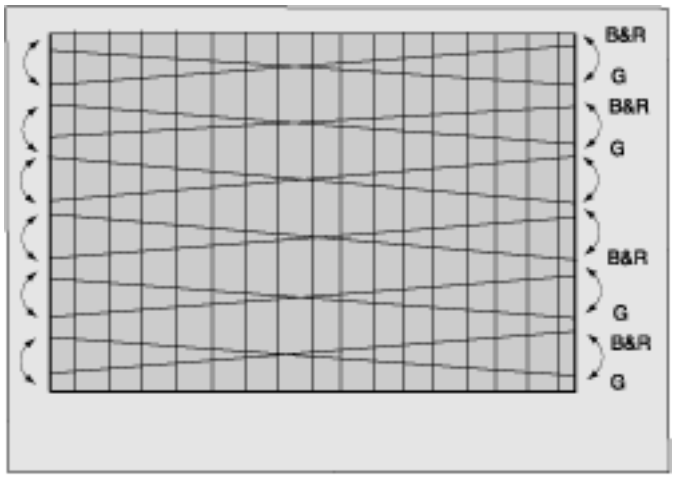
VR2 adjustment (YH)



XV Adjustment (precise adjustment)

1. Apply a crosshatch pattern.
2. Adjust contrast and brightness customer controls to obtain a correct picture.
3. With a driver adjust the coil located in deflection yoke board to obtain a proper convergence horizontally.

Coil adjustment (Xv)



NOTE

Apply a red pattern and confirm purity, if purity is poor, repeat purity adjustments.

TOP PREVIOUS NEXT

13.2 Permalloy convergence corrector strip (Part No. 0FMK014ZZ)

TOP PREVIOUS NEXT

This strip is used in some sets to match the yoke and CRT for optimum convergence. If the yoke or CRT is replaced, the strip may not be required.

First converge the set without the strip and observe the corners.

First converge the set without the strip and observe the corners.

If correction is needed:

1. Place strip between CRT and yoke, in quadrant needing correction. Slowly move it around for desired results.

2. Press adhesive tightly to the CRT and secure with tape.

TOP PREVIOUS NEXT

13.3 DAF adjustment (Dynamic focus adjustment)

TOP PREVIOUS NEXT

The purpose of this adjustment is to move the focus in the picture, so the focus is in balance in the whole picture (same level). Perform this adjustment as a visual adjustment, centering both waveforms, repeat adjustment until best adjustment isobtained.

PREPARATION

1. Picture settings normalized.
2. Picture mode set to VIVID.

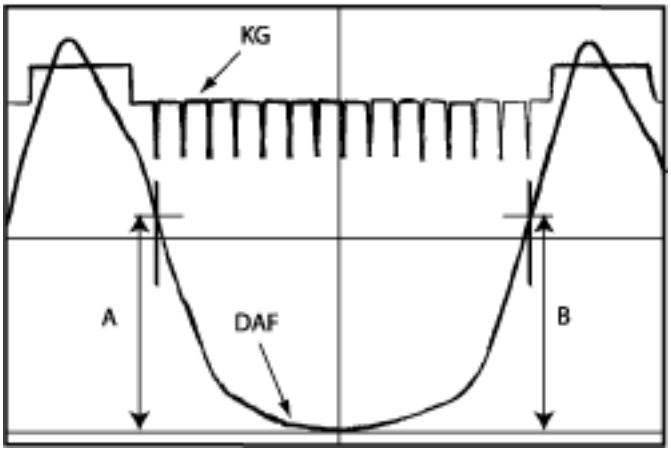
PREPARATION

1. Apply a crosshatch pattern.
2. Connect channel one of the oscilloscope with 100x1 probe to DAF OUT on J172 (D-Board).
3. Connect channel two of the oscilloscope with 10x1 probe to KG (L-Board).
4. If the the points A and B are different adjust, in service mode, adjust (HDAFS) DATA so that become the same position.
5. Apply a 1080i crosshatch pattern and repeat from step 1 to step 4.

   NOTE

   Both waveforms should be centered. Upper waveform could be different depending on the pattern applied

DAF adjustment



Other method (DAF adjustment)

PREPARATION

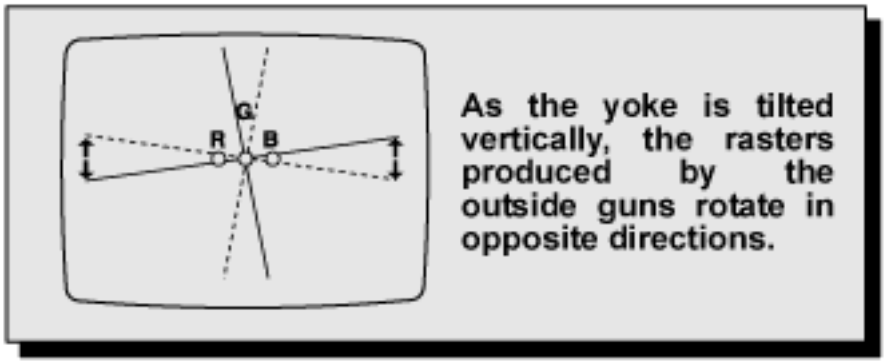
1. Picture settings normalized.
2. Picture mode set to VIVID.

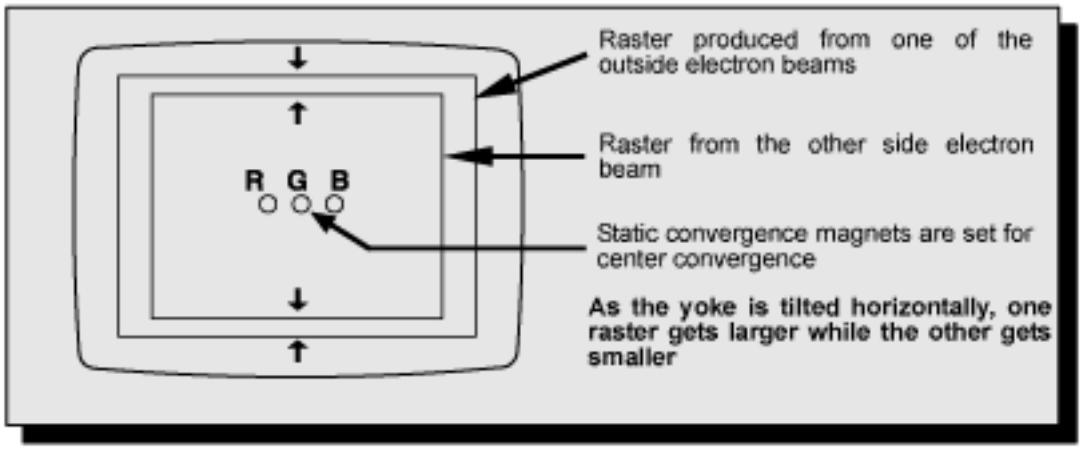
PROCEDURE

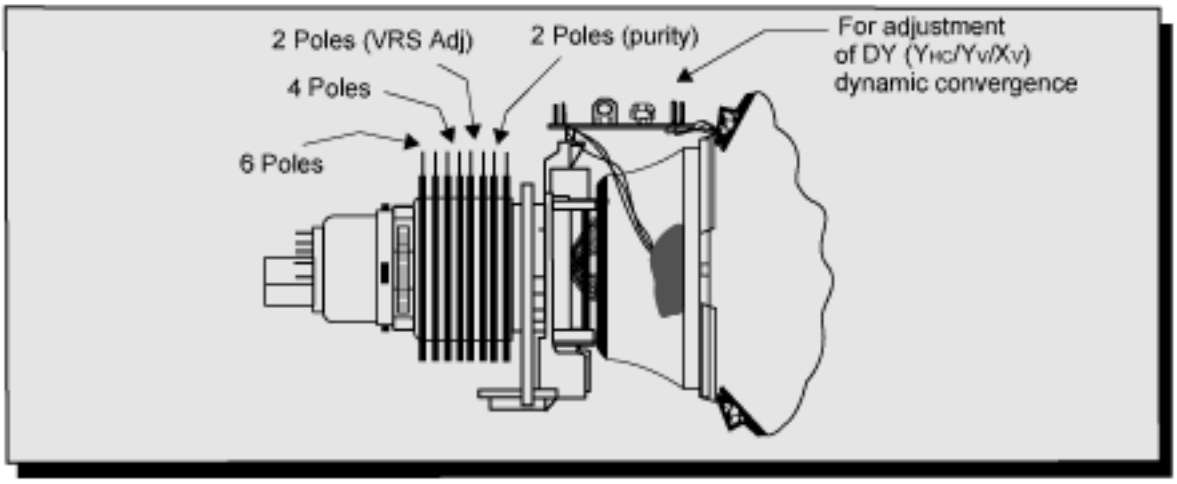
1. Apply a crosshatch pattern.
2. Put a mark in the focus control (on fly-back), so the control can be put back in the original position.
3. Turn the focus control (fly-back) fully, so the image is out focus.
4. Then in service mode adjust (HDAFS) DATA, so the focus is moving from side to side in the picture.
5. Adjust (HDAFS) DATA so the picture looks in balance in left and right.
6. Turn focus (fly-back) control back to its original position.
7. Apply a 1080i crosshatch pattern and repeat from step 1 to step 6.

NOTE

Repeat adjustment until best adjustment is obtained. For best adjustment, use oscilloscope as described in previous adjustment method.




R G B
Raster produced from one of the outside electron beams
Raster from the other side electron beam
Static convergence magnets are set for center convergence
As the yoke is tilted horizontally, one raster gets larger while the other gets smaller



TOP PREVIOUS NEXT

14 Service mode (electronic adjustments)

TOP PREVIOUS NEXT

This receiver has electronic technology using the IC bus concept. It performs as a control function and it replaces many mechanical controls. Instead of adjusting mechanical controls individually, many of the control functions are now performed byusing on screen display menu . (The service adjustment mode).

NOTE

It is suggested that the technician reads all the way through and understand the following procedure for entering/exiting the service adjustment mode; then proceed with the instructions working with the receiver. When becoming familiarwith the procedure, the flow chart for service mode may be used as a quick guide.

Quick entry to service mode

When minor adjustments need to be done to the electronic controls, the method of entering the service mode without removal of the cabinet back is as follows using the remote control:

1. Select SET-UP icon and select CABLE mode.
2. Select TIMER icon and set SLEEP time for 30 Min.
3. Exit menus.
4. Tune to the channel 124.
5. Adjust VOLUME to minimum (0).
6. Press VOL → (decrease) on receiver. Red CHK appears in upper corner.

   NOTE

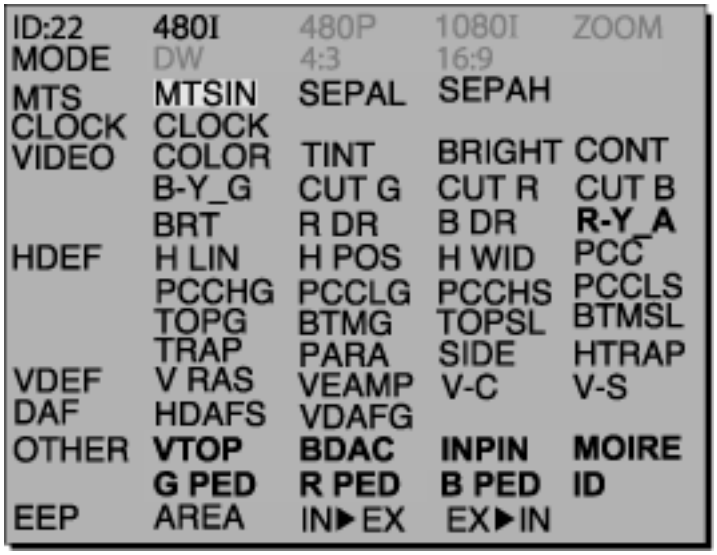
   After receiver is set into service mode, set TIMER back to NO.

   To toggle between aging and service modes:

   While the CHK is displayed on the left top corner of the CRT, pressing ACTION and VOL U

on the TV simultaneously will toggle between the modes. Red CHK for serviceand yellow CHK for aging.

7. Press POWER on the remote control to display the service adjustment modes menu, select adjustment by pressing the volume right/left buttons and channel up/down buttons on the remote and ACTION to enter the adjustment.


ID:22 480I 480P 1080I ZOOM
MODE DW 4:3 16:9
MTS MTSIN SEPAL SEPAH
CLOCK CLOCK
VIDEO COLOR TINT BRIGHT CONT
B-Y_G CUT G CUT R CUT B
BRT R DR B DR R-Y_A
HDEF H LIN H POS H WID PCC
PCCHG PCCLG PCCHS PCCLS
TOPG BTMG TOPSL BTMSL
TRAP PARA SIDE HTRAP
VDEF V RAS VEAMP V-C V-S
DAF HDAFS VDAFG
OTHER VTOP BDAC INPIN MOIRE
G PED R PED B PED ID
EEP AREA IN▶EX EX▶IN

NOTE

Some adjustments are available only in some modes (480i, 480p, 1080i); it is needed to apply the format. A 1080i, 480p, 480i pattern can be obtained from Panasonic s TU-DST51 set-top box DTV decoder.

Exiting the service mode:

This TV goes out from service mode when it is unplugged or turned OFF. To exit the service mode, turn the TV OFF or unplug the TV from A.C.

Other method

Press ACTION and POWER on the receiver simultaneously for at least 2 seconds.

The receiver momentarily shuts off; then comes back on tuned to channel 3 with a preset level of sound.

Any programmed channels, channels caption data and some others user defined settings will be erased when exited by pressing ACTION and POWER on receiver.

IMPORTANT NOTE

Always check that the TV exits the service mode.

To confirm colors

When in service mode (red CHK is displayed) press RECALL on the remote control to enter the purity field check mode

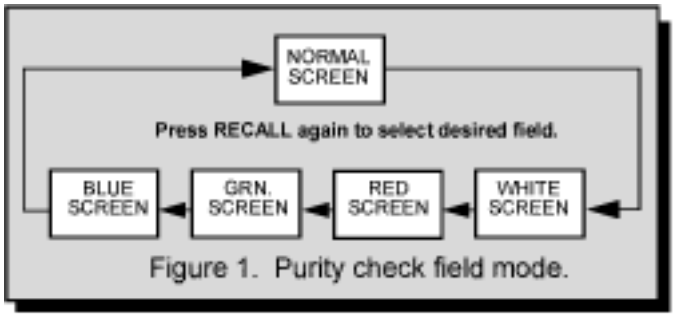


Figure 1. Purity check field mode.

Entering service mode (open-back method)

While the receiver is connected and operating in normal mode, momentarily short test point FA1 (A15 pin 2) to cold ground (A-Board).

The receiver enters the aging mode.

Yellow letters CHK appear in the upper left corner of the screen.
(The volume right/left and channel up/down will adjust rapidly).

14.1 Service adjustment default values for service items

14.2 Instructional flow chart for service mode

TOP PREVIOUS NEXT

14.1 Service adjustment default values for service items

TOP PREVIOUS NEXT

REGISTER	DESCRIPTION	FORMAT		
		NTSC	1080i (16:9)	1080i (4:3)
MTSIN	INPUT LEVEL	21	N/A	N/A
SEPAL	LOW LEVEL SEPARATION	06	N/A	N/A
SEPAH	HIGH LEVEL SEPARATION	19	N/A	N/A
CLOCK	CLOCK	128	N/A	N/A
COLOR	COLOR	20	20	N/A
TINT	TINT	80	80	N/A
BRIGH	SUB-BRIGHTNESS	09 A0	09 A0	N/A
CONT	SUB-CONTRAST	02 A0	02 A0	N/A
B-Y_G	MAGENTA TINT ADJ	3D	3C	N/A
CUT G	GREEN CUT-OFF	02 16	02 16	N/A
CUT R	RED CUT-OFF	02 72	02 72	N/A
CUT B	BLUE CUT-OFF	01 EA	01 EA	N/A
BRT	BRIGHT	0A 34	0A 34	N/A
R DR	RED DRIVE	85	85	N/A
B DR	BLUE DRIVE	87	87	N/A
R-Y_A	R-Y_A	80	80	N/A
HLIN	HORIZONTAL LINEARITY	53	80	N/A
HPOS	HORIZONTAL POSITIONING	03 45	03 CE	N/A
HWID	HORIZONTAL WIDTH	B4	77	N/A
PCC	PINCUSHION CORRECTION	9B	B8	B3
PCCHG	PINCUSHION HIGH	38	3E	3E
PCCLG	PINCUSHION LOW	39	3E	3E
PCCHS	PINCUSHION HIGH	05	05	05
PCCLS	PINCUSHION LOW	05	05	05
TOPG	TOP CORNER PINCUSHION	58	5A	5A
BTMG	BOTTOM CORNER PINCUSHION	58	57	57
TOPSL	TOP CORNER PINCUSHION SLICE LEVEL	03	03	03
BTMSL	BOTTOM CORNER PINCUSHION SLICE LEVEL	03	03	03
TRAP	TRAPEZOID	80	85	85
PARA	PARALLELOGRAM	10	10	10

SIDE	E-W PINCUSHION ADJUSTMENT	16	15	15
HTRAP	HORIZONTAL TRAPEZOID	20	20	20
VRAS	VERTICAL POSITION	91	AA	A2
VEAMP	VERTICAL SIZE	01 62	00 B0	01 A4
V-C	VERTICAL LINEARITY	6E	78	78
V-S	VERTICAL S CORRECTION	56	56	56
HDAFS	HORIZONTAL DAF PHASE	00 A4	01 B4	N/A
VTOP	VTOP	00 D9	00 D1	00 FA
BDAC	BDAC	73	77	N/A
INPIN	INPIN	20	20	20
ID	ID	22	22	22
MOIRE	MOIRE	80	80	80
G PED	G PED	80	N/A	N/A
R PED	R PED	80	N/A	N/A
B PED	B PED	80	N/A	N/A

NOTE:

The above table shows the default values for the service items, this values may vary depending on the serviced TV.

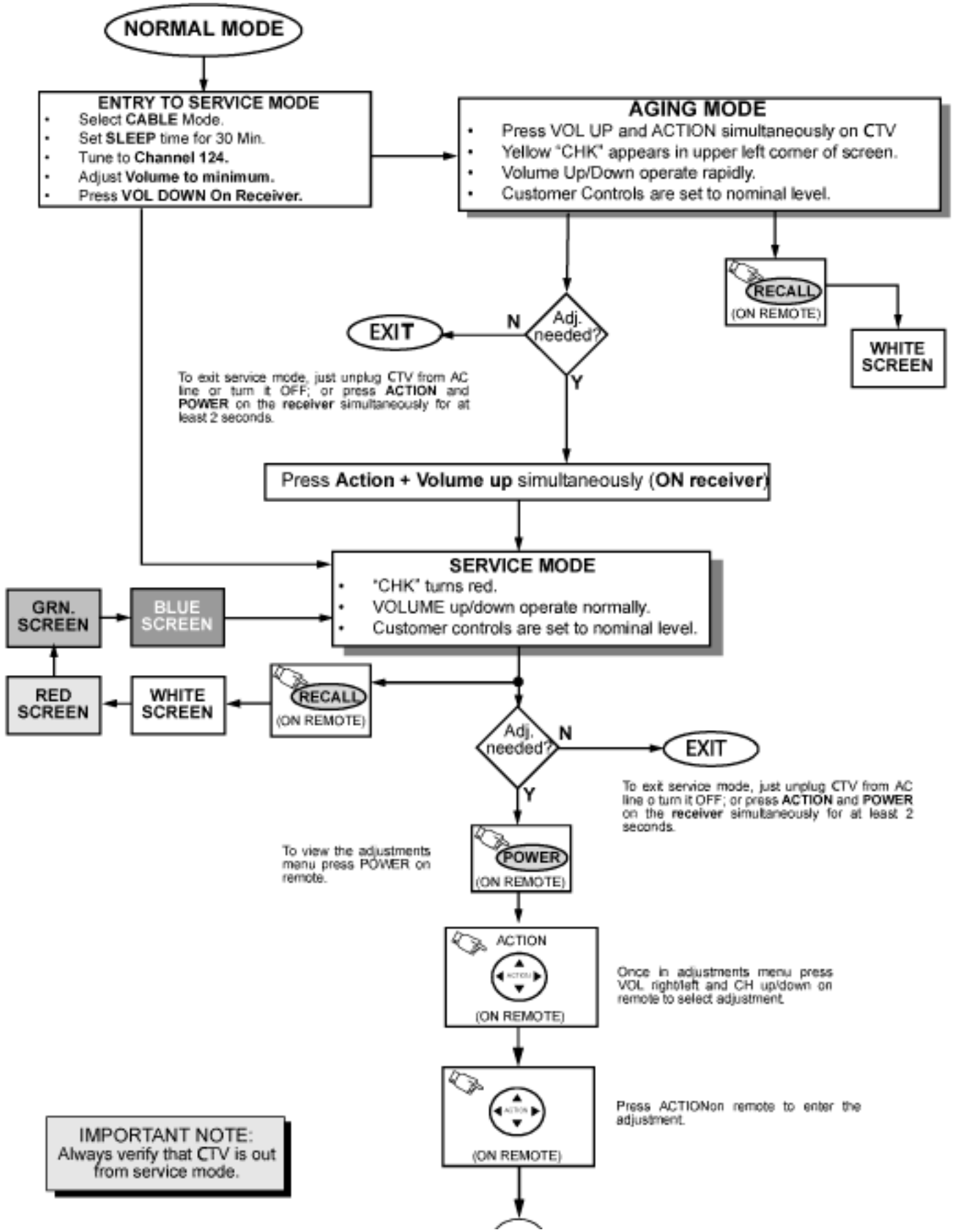
Important Note:

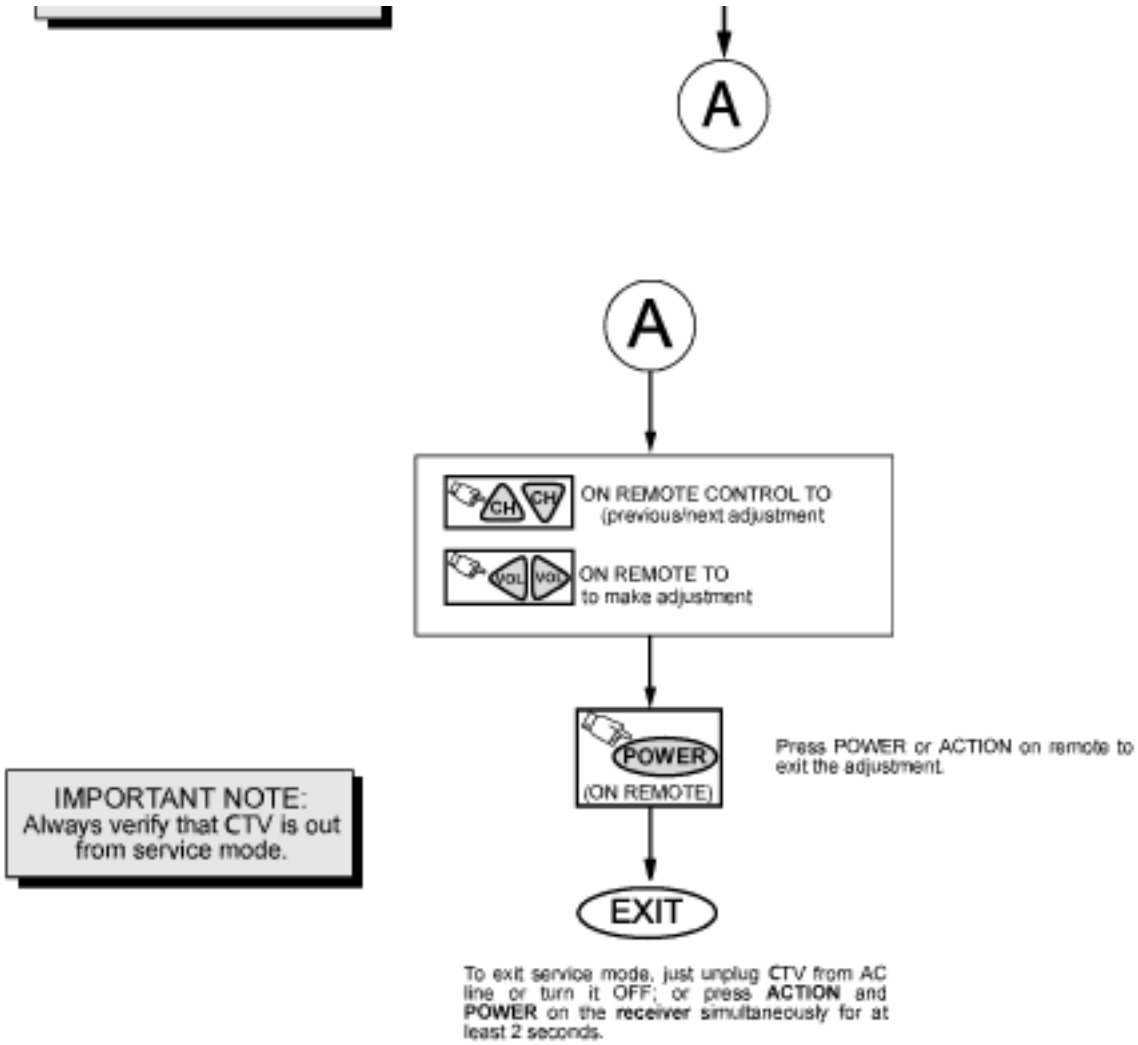
When changing ID register, message Unplug AC to activate will appear on the screen and the set mus be unplugged.

TOP PREVIOUS NEXT

14.2 Instructional flow chart for service mode

TOP PREVIOUS NEXT


NORMAL MODE
ENTRY TO SERVICE MODE
Select CABLE Mode.
Set SLEEP time for 30 Min.
Tune to Channel 124.
Adjust Volume to minimum.
Press VOL DOWN On Receiver.
AGING MODE
Press VOL UP and ACTION simultaneously on CTV
Yellow "CHK" appears in upper left corner of screen.
Volume Up/Down operate rapidly.
Customer Controls are set to nominal level.
RECALL
(ON REMOTE)
WHITE SCREEN
Adj. needed?
N
EXIT
Y
To exit service mode, just unplug CTV from AC line or turn it OFF; or press ACTION and POWER on the receiver simultaneously for at least 2 seconds.
Press Action + Volume up simultaneously (ON receiver)
SERVICE MODE
"CHK" turns red.
VOLUME up/down operate normally.
Customer controls are set to nominal level.
GRN. SCREEN
BLUE SCREEN
RED SCREEN
WHITE SCREEN
RECALL
(ON REMOTE)
Adj. needed?
N
EXIT
Y
To exit service mode, just unplug CTV from AC line o turn it OFF; or press ACTION and POWER on the receiver simultaneously for at least 2 seconds.
To view the adjustments menu press POWER on remote.
POWER
(ON REMOTE)
ACTION
(ON REMOTE)
Once in adjustments menu press VOL right/left and CH up/down on remote to select adjustment.
(ON REMOTE)
Press ACTIONon remote to enter the adjustment.
IMPORTANT NOTE:
Always verify that CTV is out from service mode.



TOP PREVIOUS NEXT

15 Service adjustments (electronic controls)

TOP PREVIOUS NEXT

NOTE

Please correlate with available pattern on all adjustments

15.1 (NTSC) Sub-Brightness Service DAC adjustment (BRIGHT)

15.2 (1080i) Sub-Brightness Service DAC adjustment (BRIGHT)

15.3 (NTSC) Sub-Contrast Service DAC adjustment (CUT-G, CONT)

15.4 (1080i) Sub-Contrast Service DAC adjustment (CUT-G, CONT)

15.5 (NTSC) Color output adjustment Service DAC adjustment (COLOR, TINT)

15.6 (NTSC) Color output adjustment Service DAC adjustment (COLOR, TINT, B-Y_G)

15.7 (1080i) Color output adjustment Service DAC adjustment (COLOR, TINT

15.8 Color temperature adjustment (B / W Tracking) Service DAC Adjust. (CUT R) (CUT G) (CUT B) (R DR) (B DR)

15.9 Deflection adjustments

15.9.1 (480i / 480p) H-Center adjustment

15.9.2 (480i / 480p) Vertical linearity(V-C), V-Size and V-Position adjustment

15.9.3 (480i / 480p) V-S, V-Size adjustment

15.9.4 (480i / 480p) Trapezoid adjustment

15.9.5 (480i / 480p) Parallelogram adjustment

15.9.6 (480i / 480p) E-W PCC balance adjustment

15.9.7 (480i / 480p) PCC adjustment

15.9.8 (480i / 480p) Corner PCC adjustment

15.9.9 (480i / 480p) H-Size adjustment

15.9.10 (480i / 480p 16:9 and 480i / 480p split) Vertical linearity(V-C) and V-Position adjustment

15.9.11 (480i / 480p 16:9 and 480i / 480p split) V-S, V-Size adjustment

15.9.12 (480i / 480p 16:9 and 480i / 480p split) H-Trapezoid adjustment

15.9.13 (480i / 480p 16:9 and 480i / 480p split) Trapezoid adjustment

15.9.14 (480i / 480p 16:9 and 480i / 480p split) E-W PCC adjustment

15.9.15 (480i / 480p 16:9 and 480i / 480p split) PCC adjustment

15.9.16 (480i / 480p 16:9 and 480i / 480p split) Corner PCC adjustment

15.9.17 1080i letter and split) H-Center adjustment

15.9.18 (1080i letter and split) Vertical linearity(V-C) and V-Position adjustment

15.9.19 (1080i letter and split) V-S, V-Size adjustment

15.9.20 (1080i letter and split) Trapezoid adjustment

15.9.21 (1080i letter and split) Parallelogram adjustment

15.9.22 (1080i letter and split) PCC adjustment

15.9.23 (1080i letter and split) Corner PCC adjustment

15.9.24 (1080i letter and split) E-W PCC adjustment

15.9.25 (1080i letter and split) H-Width adjustment

15.9.26 (1080i full) H-Size, V-SIZE adjustment

15.9.27 (1080i full) Vertical linearity(V-C) and V-Position adjustment

15.9.28 (1080i full) V-S, V-Size adjustment

15.9.29 (1080i full) Trapezoid adjustment

15.9.30 (1080i full) Parallelogram adjustment

15.9.31 (1080i full) E-W PCC adjustment

15.9.32 (1080i full) Corner PCC adjustment

15.10 MTS circuit adjustmens

15.11 Clock adjustment (CLOCK)

15.12 Service Adjustments Mechanical Controls

TOP PREVIOUS NEXT

15.1 (NTSC) Sub-Brightness Service DAC adjustment (BRIGHT)

TOP PREVIOUS NEXT

Adjustment of this control is important for setting proper operation of customer brightness and picture controls. Do not adjust the SCREEN VR after the sub-brightness is set.

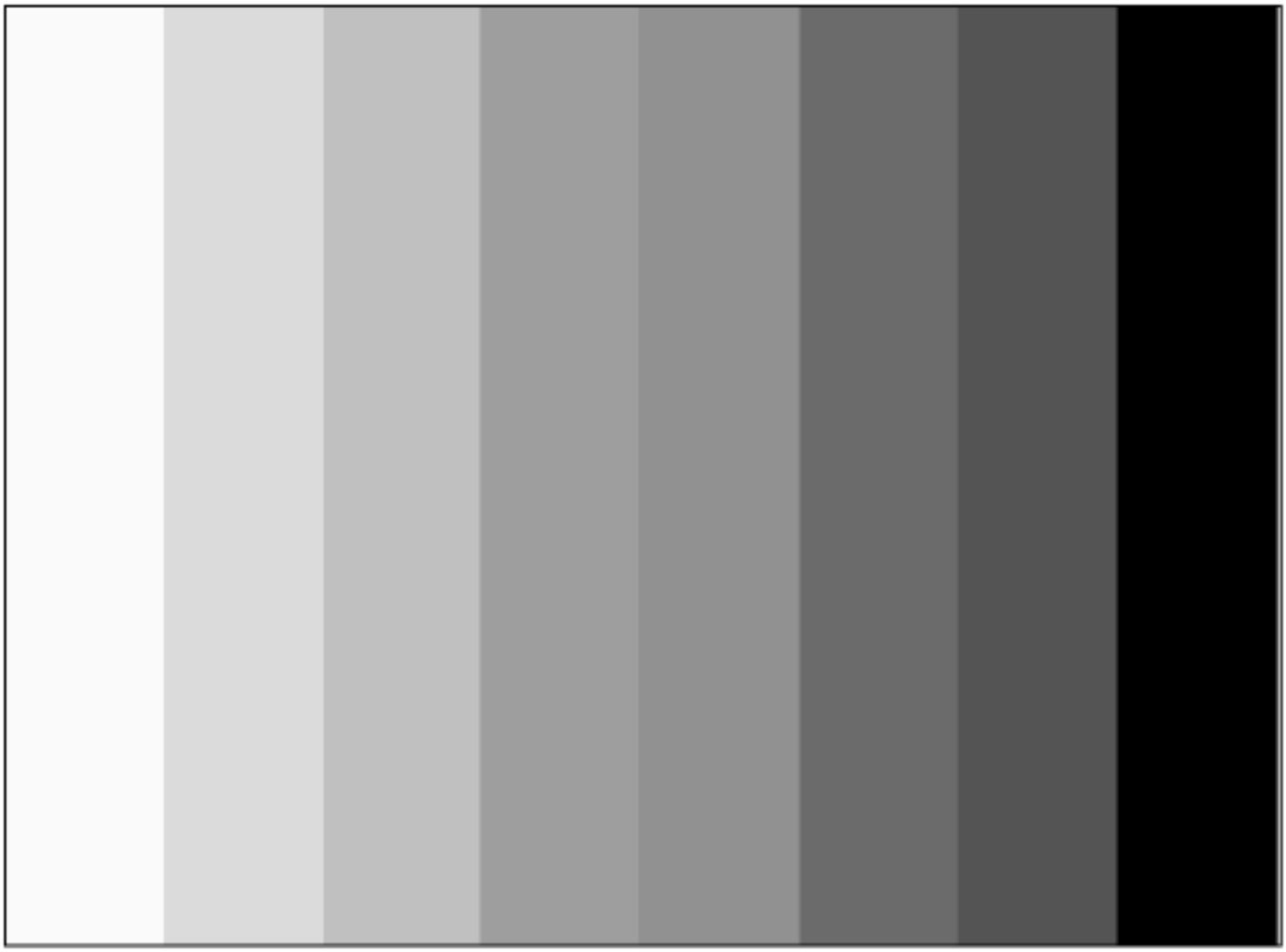
Preparation

1. Normalize picture settings.
2. Picture mode set to VIVID.
3. Switch NATURAL COLOR to OFF.
4. Switch COLOR TEMPERATURE to COOL.

Procedure

1. Apply a colorbar with no color pattern.
2. In the service mode for making electronic adjustments, select the DAC adjustment BRIGHT and adjust data so that 7.5IRE part is the same light output as the 3IRE part

Bars pattern



TOP PREVIOUS NEXT

15.2 (1080i) Sub-Brightness Service DAC adjustment (BRIGHT)

TOP PREVIOUS NEXT

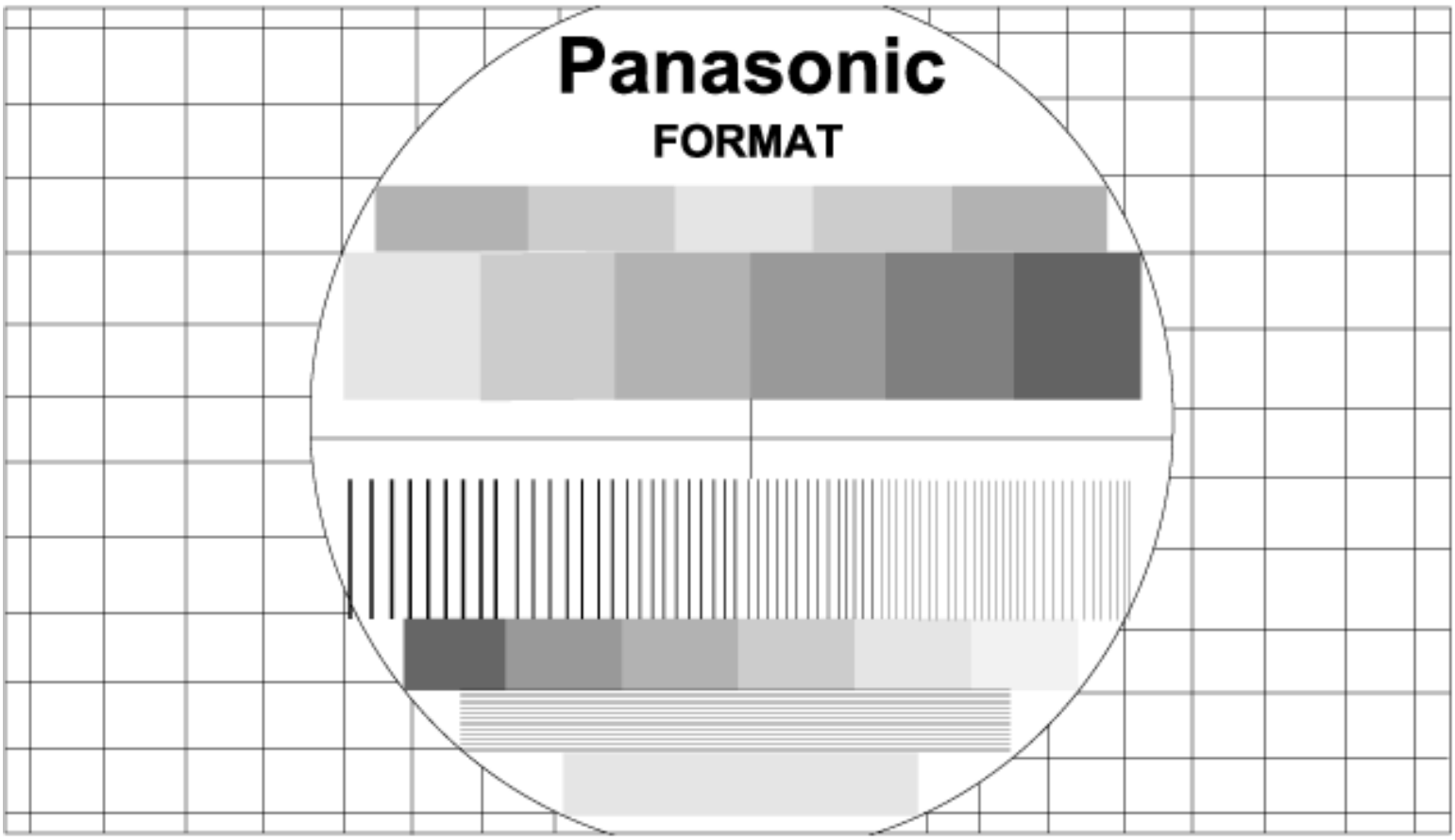
Adjustment of this control is important for setting proper operation of customer brightness and picture controls. Do not adjust the SCREEN VR after the sub-brightness is set.

Preparation

1. Normalize picture settings.
2. Picture mode set to VIVID.
3. Switch NATURAL COLOR to OFF.
4. Switch COLOR TEMPERATURE to COOL.

Procedure

1. Apply a colorbar with no color pattern.
2. In the service mode for making electronic adjustments, select the DAC adjustment BRIGHT and adjust data so that 7.5IRE part is the same light output as the 3IRE part



TOP PREVIOUS NEXT

15.3 (NTSC) Sub-Contrast Service DAC adjustment (CUT-G, CONT)

TOP PREVIOUS NEXT

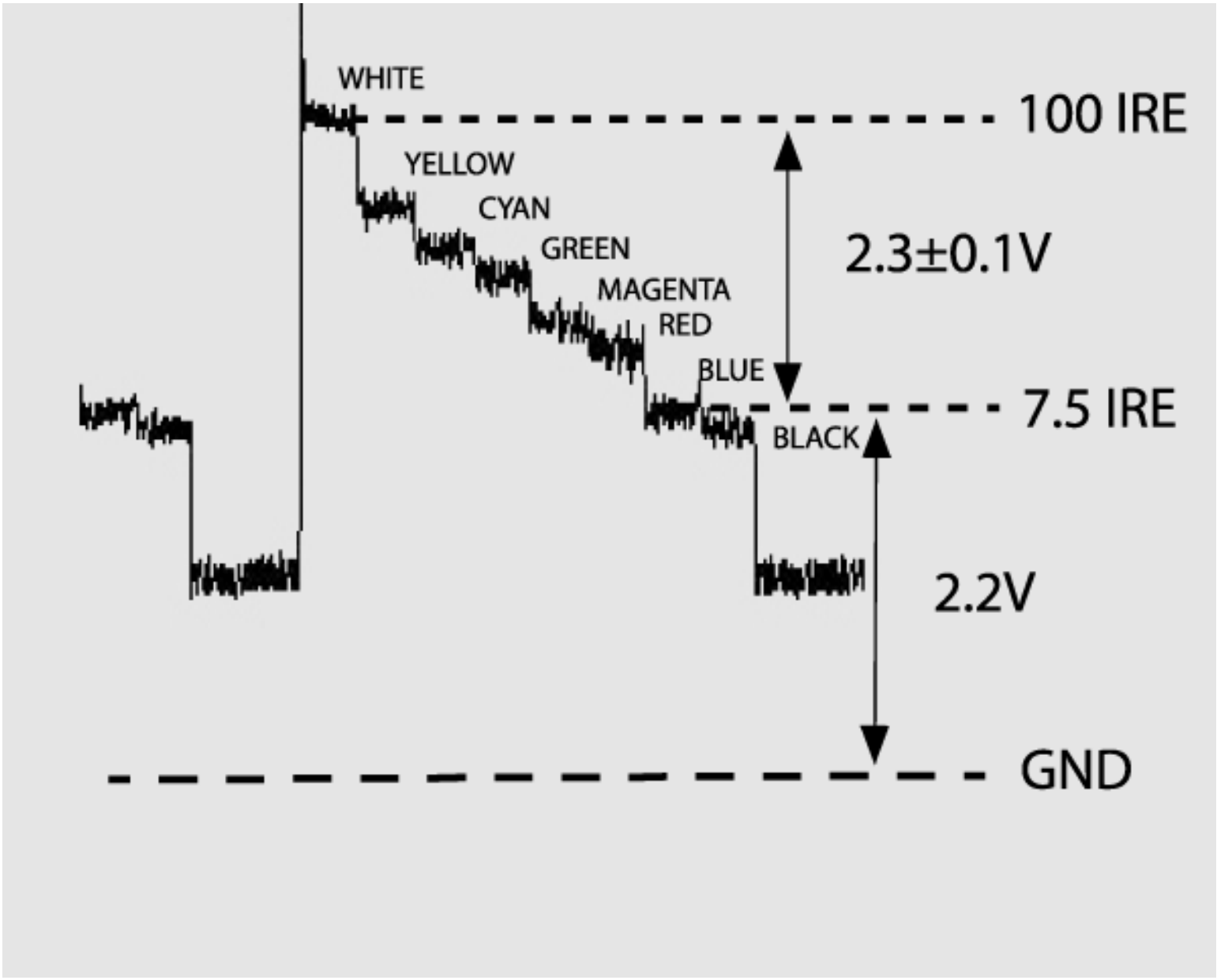
This adjustment is factory set. Do not adjust unless repairs are made to associated circuit, the CRT Board or when the CRT is replaced.

Preparation

1. Apply a colorbar pattern.
2. Set the PICTURE settings to normal.
3. Set color to minimum (no color on picture).
4. Set PICTURE mode to VIVID
5. Connect the oscilloscope to TP47G.

Procedure

1. In the service mode, select DAC for brightness adjustment BRIGH and set data to 1 D0 .
2. In service mode, select DAC for green cutoff adjustment CUT-G , and adjust data to obtain 2.2 V between 7.5IRE and GND level at TP47G. (See waveform detail)
3. In service mode, select DAC for contrast adjustment CONT , and adjust data to obtain 2.3±0.1V between 7.5IRE and 100IRE level at TP47G. (See waveform detail)



TOP PREVIOUS NEXT

15.4 (1080i) Sub-Contrast Service DAC adjustment (CUT-G, CONT)

TOP PREVIOUS NEXT

This adjustment is factory set. Do not adjust unless repairs are made to associated circuit, the CRT Board or when the CRT is replaced.

PREPARATION

1. Apply a 1080i pattern (colorbar no color).
2. Set the PICTURE settings to normal.
3. Set PICTURE mode to VIVID
4. Connect the oscilloscope to TP47G.

PROCEDURE

1. In the service mode, select DAC for brightness adjustment BRIGH to obtain 2.0V between 0 IRE and GND level at TP47G
2. In service mode, select DAC CONT , and adjust data to obtain 2.5±0.1V between 0 IRE and 100 IRE level at TP47G

TOP PREVIOUS NEXT

15.5 (NTSC) Color output adjustment Service DAC adjustment (COLOR, TINT)

TOP PREVIOUS NEXT

NOTE

if a rainbow pattern generator is available perform the following procedure; the next section describes the procedure with no rainbow pattern.

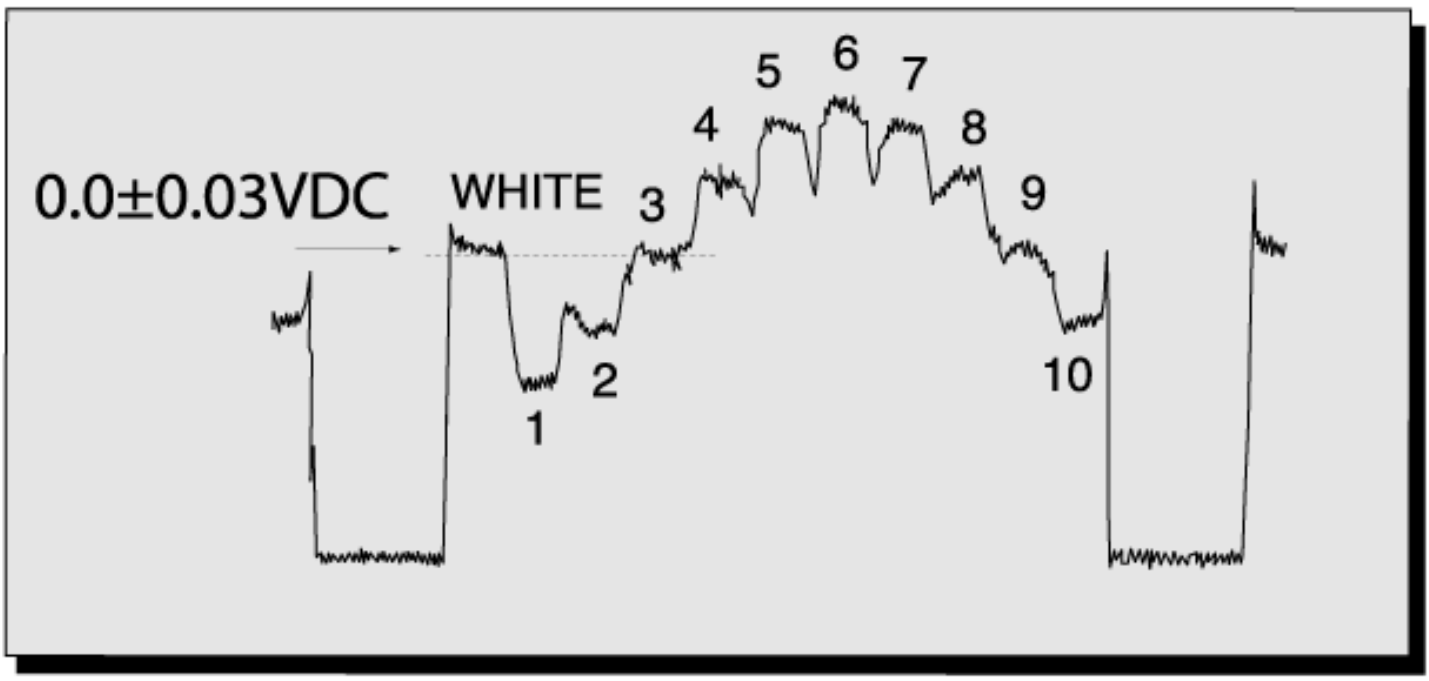
Make sure that sub-contrast adjustment was finished prior to perform this adjustment

PREPARATION

1. Normalize the picture settings.
2. Set picture mode to VIVID
3. Switch NATURAL COLOR to OFF.

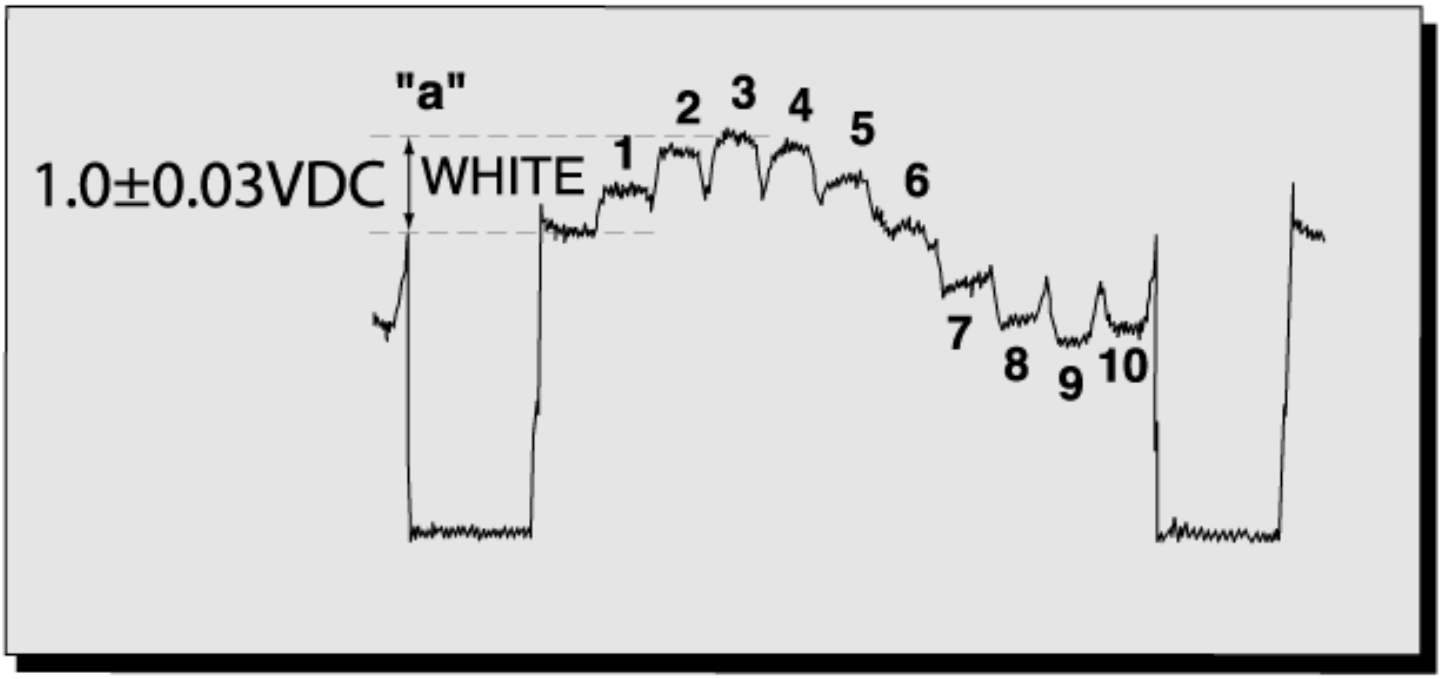
PROCEDURE

1. Apply a rainbow color bar pattern.
2. In service mode adjust R DR and B DR data to 80 .
3. Connect the oscilloscope to TP47B.
4. In service mode adjust TINT data so that the peak white is located at same level as peak 3 , within 0±0.03V. (See waveform detail)



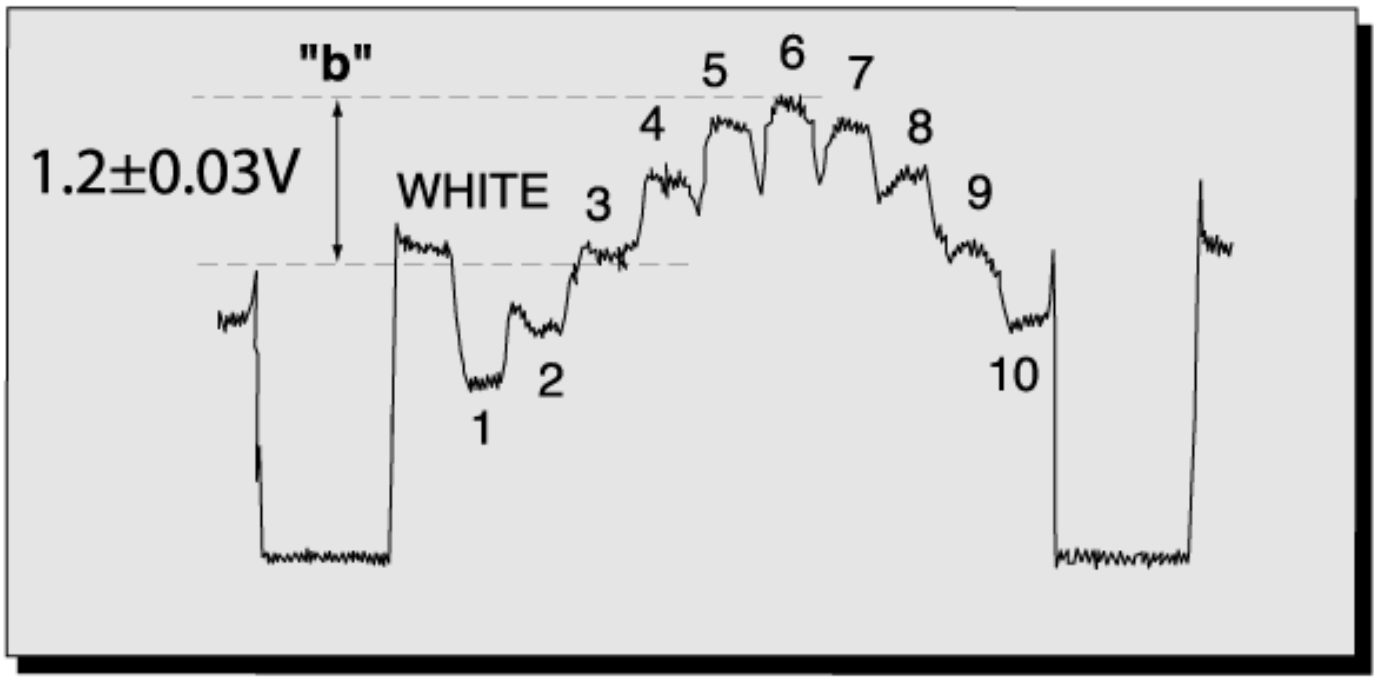
5. Connect the oscilloscope to TP47R.

6. In service mode adjust COLOR data so that the amplitude a is 1.0±0.03V.



7. Connect the oscilloscope to TP47B.

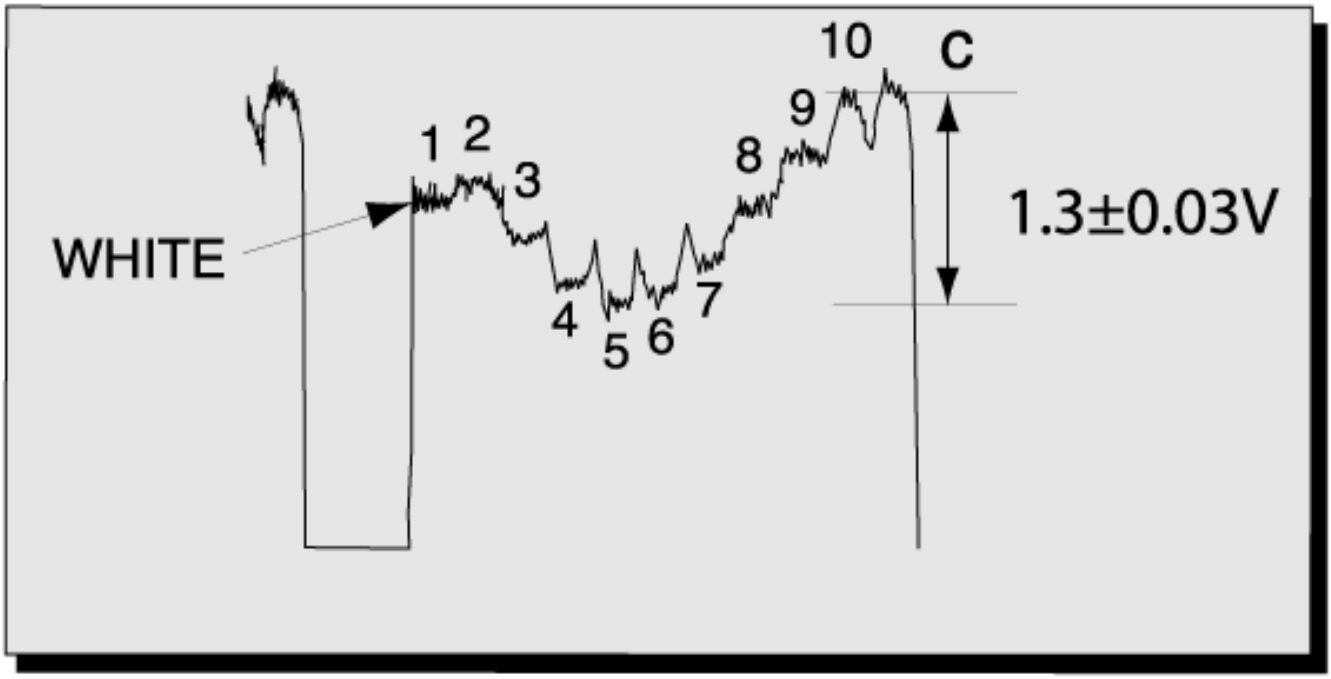
8. In service mode adjust B-Y G data so that the amplitude b is 1.2±0.03V (between 3rd and 6th peaks).



9. With oscilloscope still connected to TP47B, adjust TINT data so that the peak 9 is located at same level as peak 3 , within 0±0.03V, then increase TINT databy 9 steps.

10. Connect oscilloscope to TP47G.

11. In service mode adjust COLOR data so that the amplitude C is 0.92•0.02V.



12. Apply a studio color bar pattern and confirm that saturation and phase are normal (normal image).

TOP PREVIOUS NEXT

15.6 (NTSC) Color output adjustment Service DAC adjustment (COLOR, TINT, B-Y_G)

TOP PREVIOUS NEXT

NOTE

Color and tint adjustment sets the reference settings for the user controls; It is important to read the procedures.

(NO RAINBOW PATTERN)

Make sure that sub-contrast adjustment was finished prior to perform this adjustment

PREPARATION

1. Normalize the picture settings.
2. Set picture mode to VIVID
3. Switch NATURAL COLOR to OFF.

PROCEDURE

1. Apply a color bar pattern.
2. In service mode adjust R DR and B DR data to 80 .
3. In service mode adjust TINT data so that the color does not become greenish or redish.
4. In service mode adjust COLOR data so that the color level is not too high (saturated) or too low (tending to black and white).
5. In service mode adjust B-Y G data so that blue and green seem natural.
6. confirm that saturation and picture are normal (normal image).
7. If image is not satisfactory, repeat adjustment until the images is normal and natural

NOTE

The image can be compared against other set to see the image quality.

TOP PREVIOUS NEXT

15.7 (1080i) Color output adjustment Service DAC adjustment (COLOR, TINT

TOP PREVIOUS NEXT

Make sure that sub-contrast adjustment was finished prior to perform this adjustment

PREPARATION

1. Normalize the picture settings.
2. Set picture mode to VIVID
3. Switch NATURAL COLOR to OFF.

PROCEDURE

1. Apply a 1080i pattern or signal
2. In service mode adjust R DR and B DR data to 80 .
3. In service mode adjust TINT data so that the color does not become greenish or redish.
4. In service mode adjust COLOR data so that the color level is not too high (saturated) or too low (tending to black and white).
5. In service mode adjust B-Y G data so that blue and green seem natural.
6. confirm that saturation and picture are normal (normal image).
7. If image is not satisfactory, repeat adjustment until the image is normal and natural.

   NOTE

   The image can be compared against other set to see the image quality.

TOP PREVIOUS NEXT

15.8 Color temperature adjustment (B/W Tracking) Service DAC Adjust. (CUT R) (CUT G) (CUT B) (R DR) (B DR)

TOP PREVIOUS NEXT

Note:

Make sure that sub-contrast adjustment was done prior to this adjustment.

Minor Touch-Up Method

OBSERVE low and high brightness areas of a B/W picture for proper tracking. Adjust only as required for good gray scale and warm highlights .

1. LOW LIGHT areas - In service mode for making electronic adjustments, select CUT R, CUT G, CUT B and adjust the picture for gray.

2. HIGH LIGHT areas - In service mode for making electronic adjustments, select drive R DR, B DR and adjust the picture for warm whites.

Complete adjustment

PREPARATION

1. Turn the receiver ON and allow 30 minutes warm up at WHITE PATTERN.

2. Apply a color bar pattern (with no color).

3. Turn the SCREEN control (part of FBT T551) fully counterclockwise.

4. Preset the following service DACs for best results:

    - BRIGH_____1 D0
    - CUT R_____0 00
    - CUT B_____0 00
    - R DR_____80

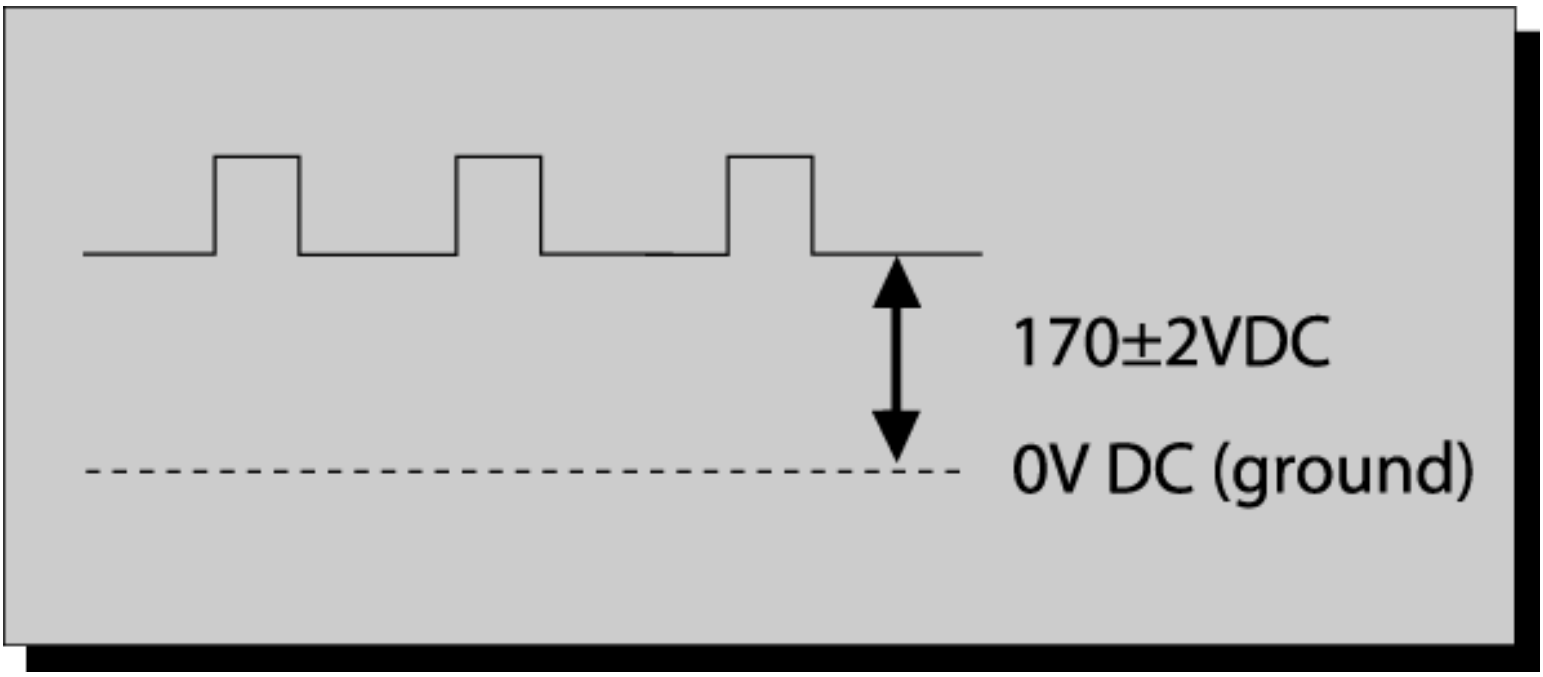
- B DR_____80
- PICTURE SETTINGS_____NORMALIZED
- PICTURE MODE_____VIVID

PROCEDURE

1. Connect the oscilloscope to KG (CRT-Board).
2. In service mode for making electronic adjustment, select BRIGH DAC.
3. Press RECALL button on the remote control to collapse the raster. (service SW).
4. Connect oscilloscope to KG on L-Board and adjust service mode CUT-G DAC until 170±2V above DC ground is measured
5. Remove the probe from KG.
6. Turn screen clockwise slowly until color is slightly appeared.
7. Then adjust CUT R and CUT B until line becomes white.
8. Press RECALL button on the remote to restore the raster.
9. Adjust R DR and B DR so the white seems like white and black like black
10. Apply a normal signal and confirm that the image is normal and a good gray scale
11. If correction is needed perform minor touch-up method.

NOTE

This adjustment (NTSC) will adjust automatically 480p and 1080i formats, no need to adjust for these formats



TOP PREVIOUS NEXT

15.9 Deflection adjustments

TOP PREVIOUS NEXT

To reset deflection adjustments

To reset deflection adjustments to factory adjusted default, enter to service mode (with red CHK displayed), press POWER button on remote to display the service menu, then press and hold RECALL button for at least three seconds, a reset messagewill appear in the image.

Use this feature when deflection adjustment gets off adjustment to the point that it cannot be adjusted back easily.

NOTE

Deflection adjustment for 480i/480p, 480i/480p 16:9 and 480i/480p split, 1080i letter and split mode are provided differently.

15.9.1 (480i / 480p) H-Center adjustment

15.9.2 (480i / 480p) Vertical linearity(V-C), V-Size and V-Position adjustment

15.9.3 (480i / 480p) V-S, V-Size adjustment

15.9.4 (480i / 480p) Trapezoid adjustment

15.9.5 (480i / 480p) Parallelogram adjustment

15.9.6 (480i / 480p) E-W PCC balance adjustment

15.9.7 (480i / 480p) PCC adjustment

15.9.8 (480i / 480p) Corner PCC adjustment

15.9.9 (480i / 480p) H-Size adjustment

15.9.10 (480i / 480p 16:9 and 480i / 480p split) Vertical linearity(V-C) and V-Position adjustment

15.9.11 (480i / 480p 16:9 and 480i / 480p split) V-S, V-Size adjustment

15.9.12 (480i / 480p 16:9 and 480i / 480p split) H-Trapezoid adjustment

15.9.13 (480i / 480p 16:9 and 480i / 480p split) Trapezoid adjustment

15.9.14 (480i / 480p 16:9 and 480i / 480p split) E-W PCC adjustment

15.9.15 (480i / 480p 16:9 and 480i / 480p split) PCC adjustment

15.9.16 (480i / 480p 16:9 and 480i / 480p split) Corner PCC adjustment

15.9.17 1080i letter and split) H-Center adjustment

15.9.18 (1080i letter and split) Vertical linearity(V-C) and V-Position adjustment

15.9.19 (1080i letter and split) V-S, V-Size adjustment

15.9.20 (1080i letter and split) Trapezoid adjustment

15.9.21 (1080i letter and split) Parallelogram adjustment

15.9.22 (1080i letter and split) PCC adjustment

15.9.23 (1080i letter and split) Corner PCC adjustment

15.9.24 (1080i letter and split) E-W PCC adjustment

15.9.25 (1080i letter and split) H-Width adjustment

15.9.26 (1080i full) H-Size, V-SIZE adjustment

15.9.27 (1080i full) Vertical linearity(V-C) and V-Position adjustment

15.9.28 (1080i full) V-S, V-Size adjustment

15.9.29 (1080i full) Trapezoid adjustment

15.9.30 (1080i full) Parallelogram adjustment

15.9.31 (1080i full) E-W PCC adjustment

15.9.32 (1080i full) Corner PCC adjustment

TOP PREVIOUS NEXT

15.9.1 (480i/480p) H-Center adjustment

TOP PREVIOUS NEXT

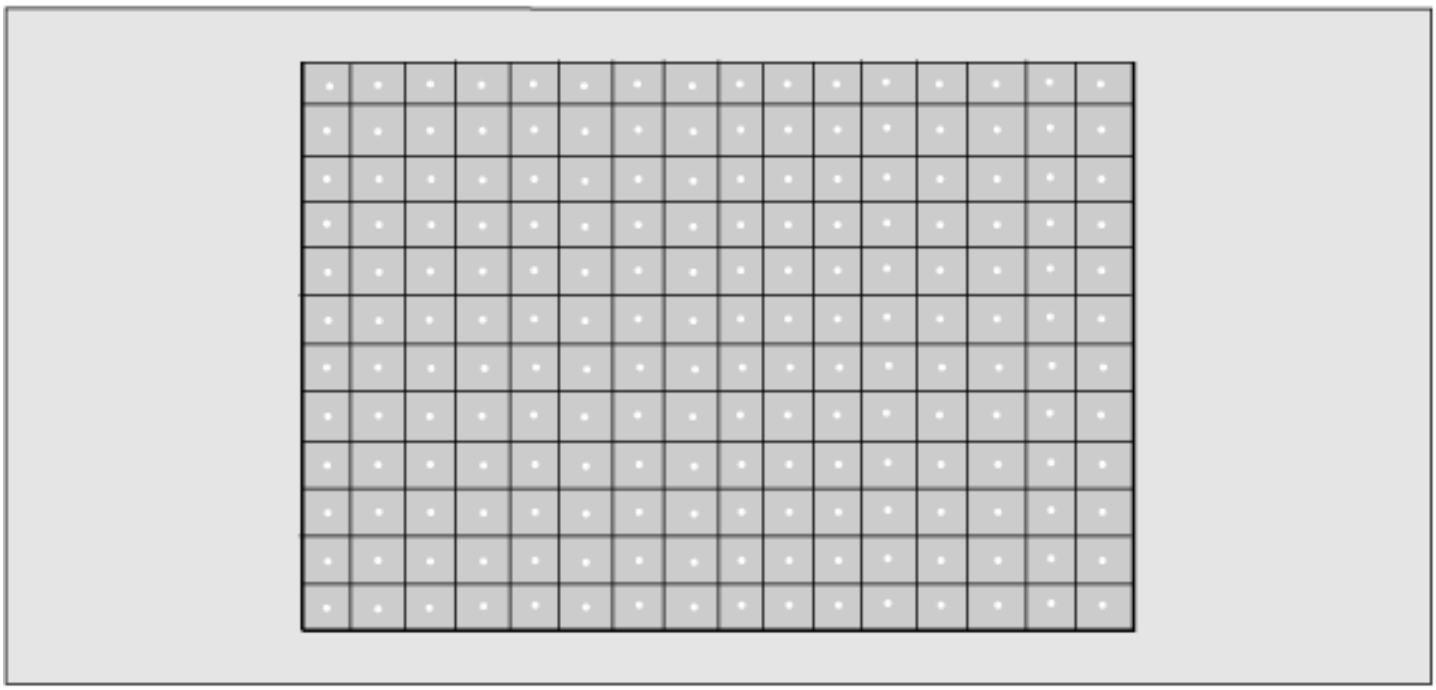
PREPARATION

1. Apply a crosshatch pattern.
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

1. If horizontal linearity is poor, in service mode, adjust data H LIN

H-Adjustment



2. Apply a pattern to center the picture.
3. If the horizontal center is not aligned, in service mode adjust H POS DATA to adjust the horizontal center of the monoscope pattern to the CRT center.

TOP PREVIOUS NEXT

15.9.2 (480i/480p) Vertical linearity(V-C), V-Size and V-Position adjustment

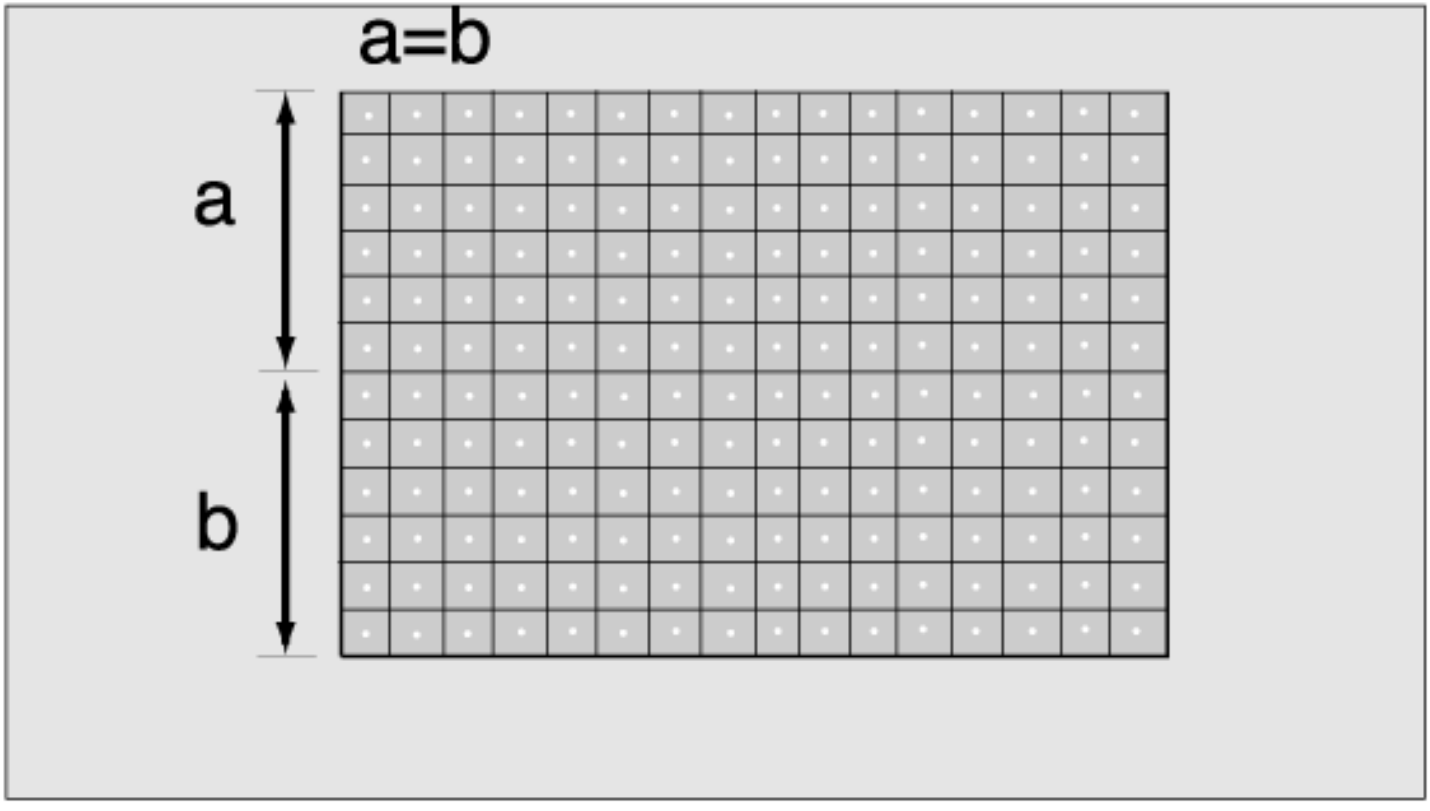
TOP PREVIOUS NEXT

PREPARATION

1. Apply a crosshatch pattern
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

1. Enter service mode, select DAC adjustment
   V-RAS and adjust crosshatch pattern to center vertical position to the CRT center.
2. Adjust linearity data V-C so that interval of a is same as b (a=b).



3. If the v-position is not at the CRT center, adjust
   V position V RAS DATA again.

4. Adjust H-TRAPEZOID data HTRAP so that the upper and lower lines becomes horizontal.

TOP PREVIOUS NEXT

15.9.3 (480i/480p) V-S, V-Size adjustment

TOP PREVIOUS NEXT

PREPARATION

1. Apply a crosshatch pattern
2. Normalize the picture settings.
3. Set picture mode to VIVID

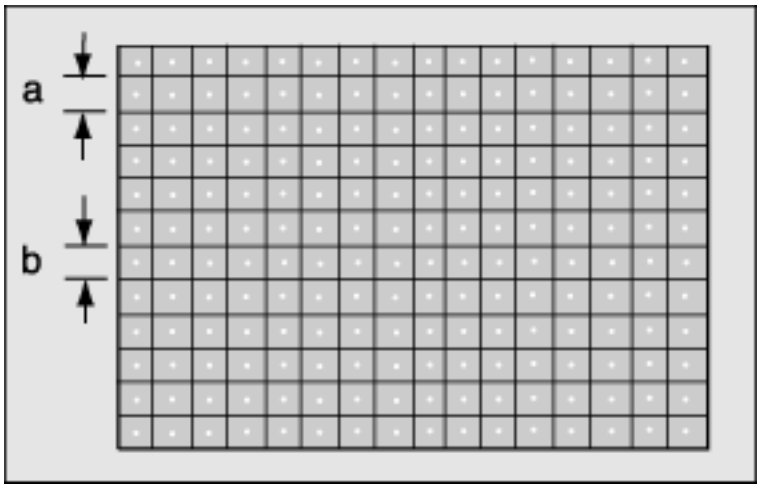
PROCEDURE

1. Enter to service mode
2. Check a and b sizes, If b-a < -1.5mm (in top & bottom extending case)
    - Increase V-S DATA by one step
    - Adjust VEAMP so that V-SIZE is regular size again.

    NOTE

    Repeat a and b until b-a ± 1.5mm
3. Confirm to make outermost circle of monoscope pattern a correct circle

V-Adjustment



TOP PREVIOUS NEXT

15.9.4 (480i/480p) Trapezoid adjustment

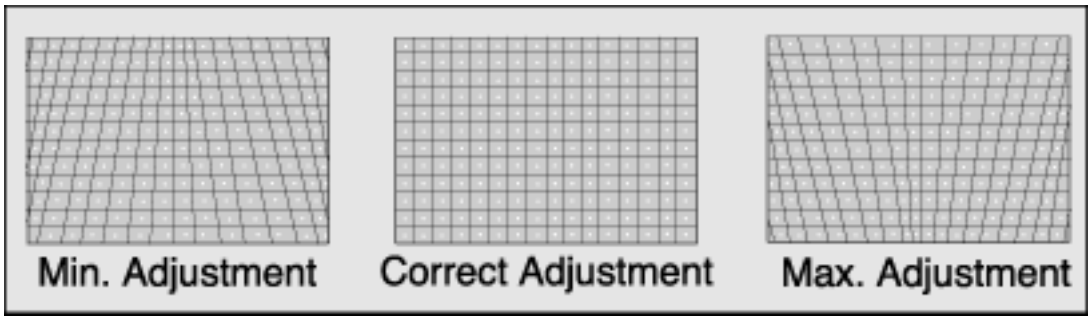
TOP PREVIOUS NEXT

PREPARATION

1. Apply a crosshatch pattern
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

1. Enter service mode, select TRAP and adjust DATA so that lines at right and left are vertical like a solid line



TOP PREVIOUS NEXT

15.9.5 (480i/480p) Parallelogram adjustment

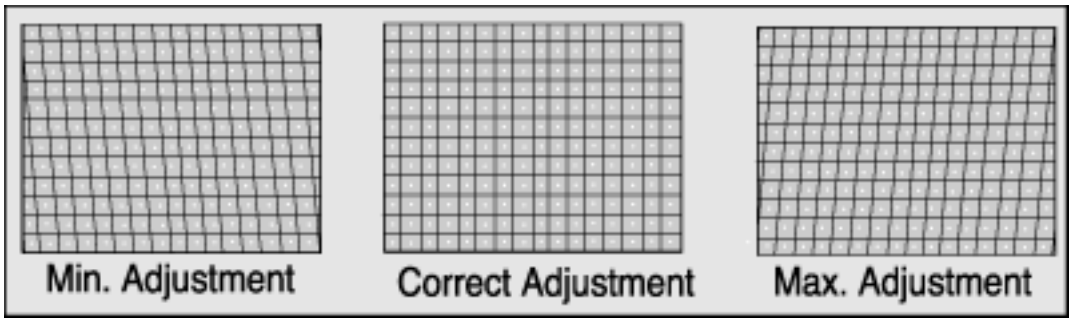
TOP PREVIOUS NEXT

PREPARATION

1. Apply a crosshatch pattern
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

1. Enter service mode, select PARA and adjust so that the lines at right and left are vertical like solid line.



TOP PREVIOUS NEXT

15.9.6 (480i/480p)
E-W PCC balance adjustment

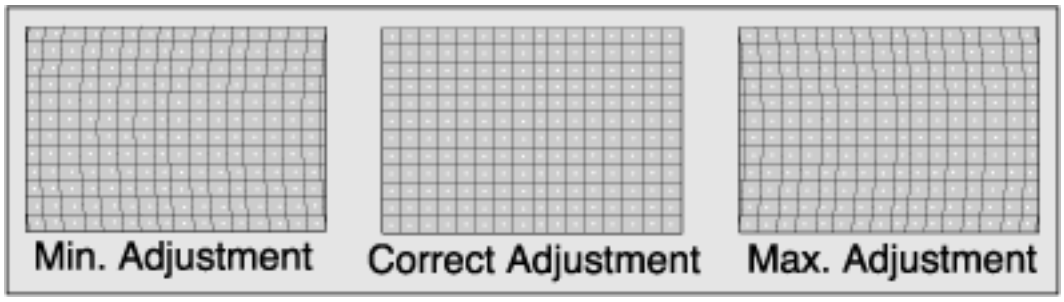
TOP PREVIOUS NEXT

PREPARATION

1. Apply a crosshatch pattern
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

1. Enter service mode, select SIDE and adjust so that lines at right and left are vertical like solid line.



TOP PREVIOUS NEXT

15.9.7 (480i/480p) PCC adjustment

TOP PREVIOUS NEXT

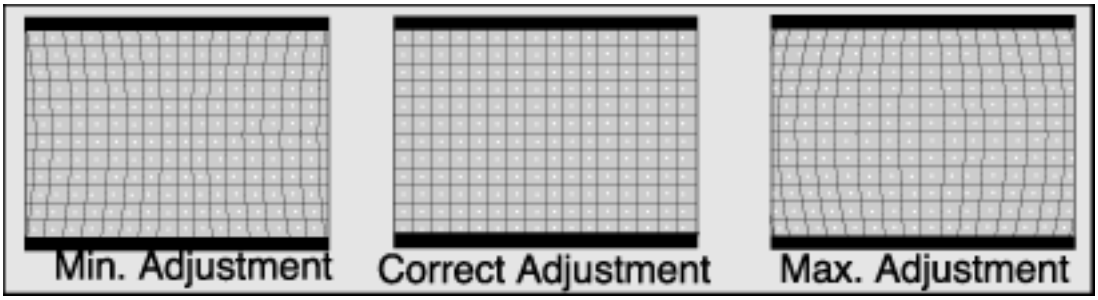
PREPARATION

1. Apply a crosshatch pattern
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

1. Confirm that trapezoid adjustment is done.
2. Adjust PCC DATA so that the 1st line and 3rd line make a good balance

PCC adjustments



NOTE

If side and lower side is imbalanced, adjust PCCHG and PCCLG so that PCC make good balance.

TOP PREVIOUS NEXT

15.9.8 (480i/480p) Corner PCC adjustment

TOP PREVIOUS NEXT

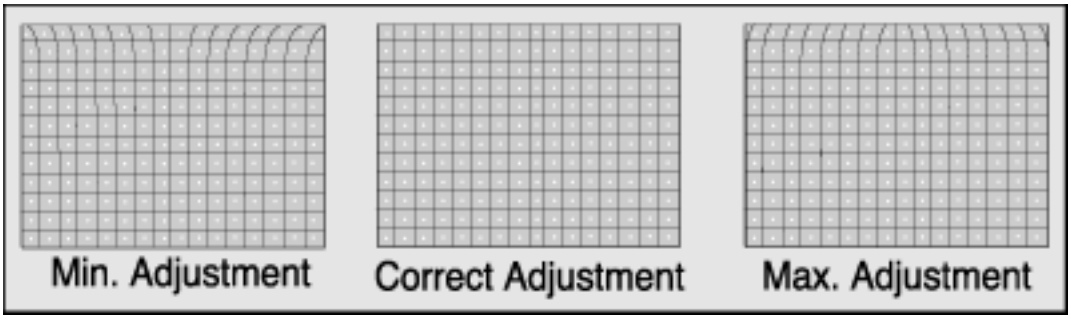
PREPARATION

1. Apply a crosshatch pattern
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

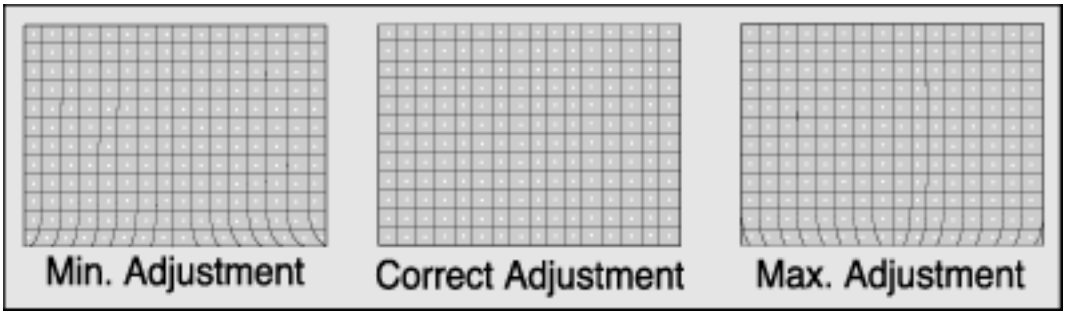
1. To adjust upper and lower linearity.
2. Adjust TOPG to straighten upper lines

Top adjustment



3. Adjust BTMG to straighten lower lines

Bottom adjustment



NOTE

If TOP-BOTTOM bending point is not so good, adjust TOPSL and BTMSL of slice level.

TOP PREVIOUS NEXT

15.9.9 (480i/480p) H-Size adjustment

TOP PREVIOUS NEXT

PREPARATION

1. Use a pattern that permits centering the image
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

1. Adjust H WID DATA so that left width and right become in good balance (not too wide or narrow).

TOP PREVIOUS NEXT

15.9.10 (480i/480p 16:9 and 480i/480p split) Vertical linearity(V-C) and V-Position adjustment

TOP PREVIOUS NEXT

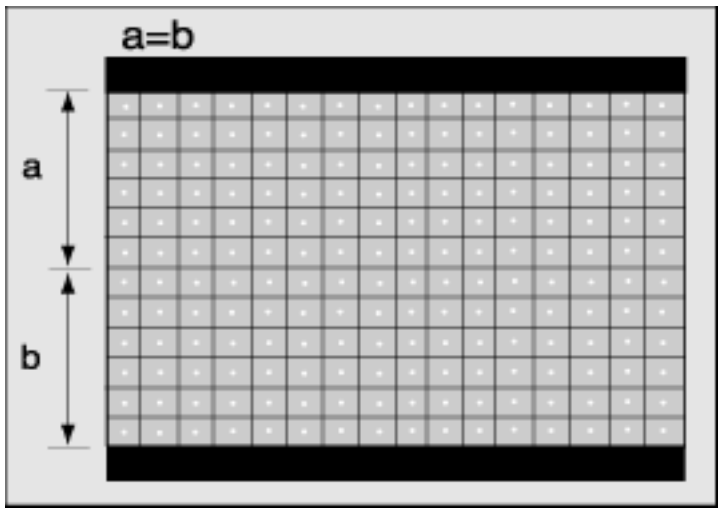
PREPARATION

1. Apply a 480p pattern
2. Set mode to 16x9 in set-up menu
3. Normalize the picture settings.
4. Set picture mode to VIVID

PROCEDURE

1. Enter service mode, select DAC adjustment
   V-RAS and adjust crosshatch pattern to center vertical position to the CRT center.
2. Adjust linearity data V-C so that interval of a is same as b (a=b).

Linearity adjustment



TOP PREVIOUS NEXT

15.9.11 (480i/480p 16:9 and 480i/480p split)
V-S, V-Size adjustment

TOP PREVIOUS NEXT

PREPARATION

1. Apply a 480p pattern
2. Set mode to 16x9 in set-up menu
3. Normalize the picture settings.
4. Set picture mode to VIVID

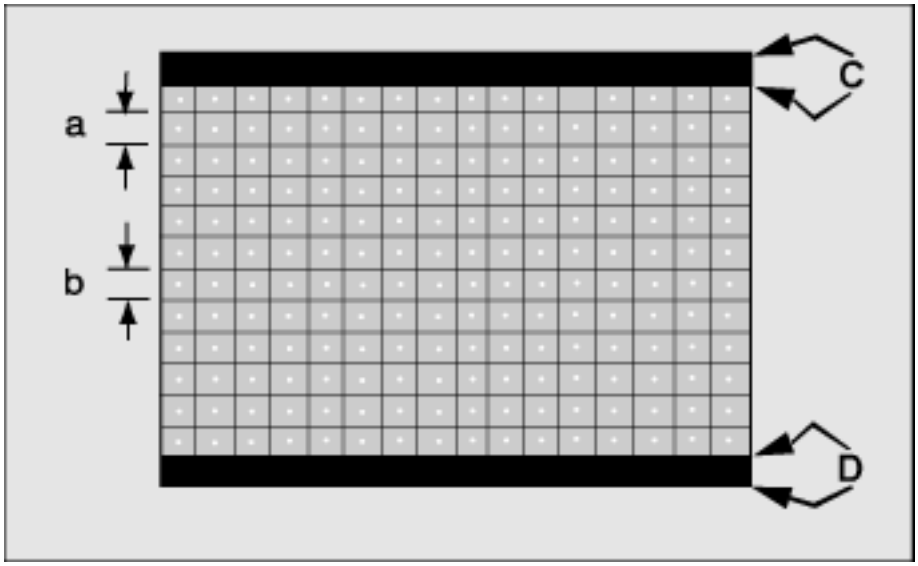
PROCEDURE

1. Enter to service mode
2. Adjust VAMP so that width C and D becomes 60mm
3. Check a and b sizes, If b-a < -1.5mm (in top and bottom extending case)
    - Increase V-S DATA by one step
    - Adjust VEAMP so that width C and D becomes 60mm for 32 and 70mm for 36 .

      NOTE

      Repeat until b-a ± 1.5mm

V-Adjustment



TOP PREVIOUS NEXT

15.9.12 (480i/480p 16:9 and 480i/480p split) H-Trapezoid adjustment

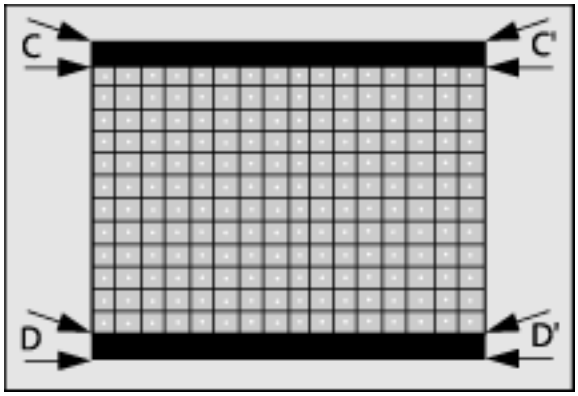
TOP PREVIOUS NEXT

PREPARATION

1. Apply a 480p pattern
2. Set mode to 16x9 in set-up menu
3. Normalize the picture settings.
4. Set picture mode to VIVID

PROCEDURE

1. Enter service mode, select HTRAP and adjust DATA so that upper and lower edges become horizontal (c=c and d=d)



TOP PREVIOUS NEXT

15.9.13 (480i/480p 16:9 and 480i/480p split) Trapezoid adjustment

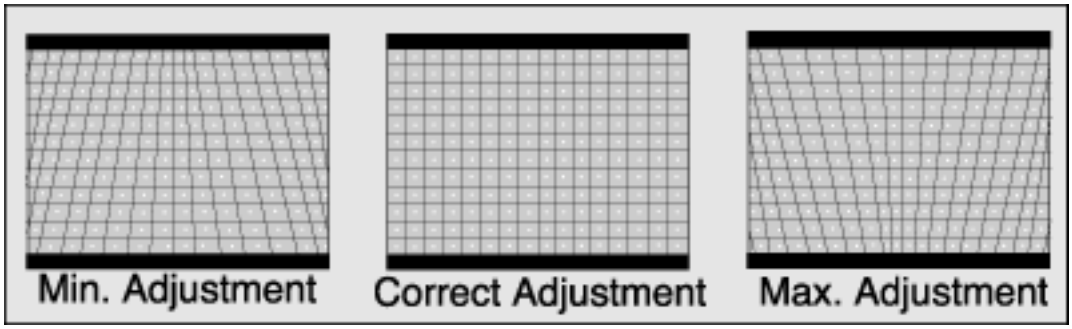
TOP PREVIOUS NEXT

PREPARATION

1. Apply a 480p pattern
2. Set mode to 16x9 in set-up menu
3. Normalize the picture settings.
4. Set picture mode to VIVID

PROCEDURE

1. Enter service mode, select TRAP and adjust DATA so that lines at right and left are vertical like a solid line



TOP PREVIOUS NEXT

15.9.14 (480i/480p 16:9 and 480i/480p split) E-W PCC adjustment

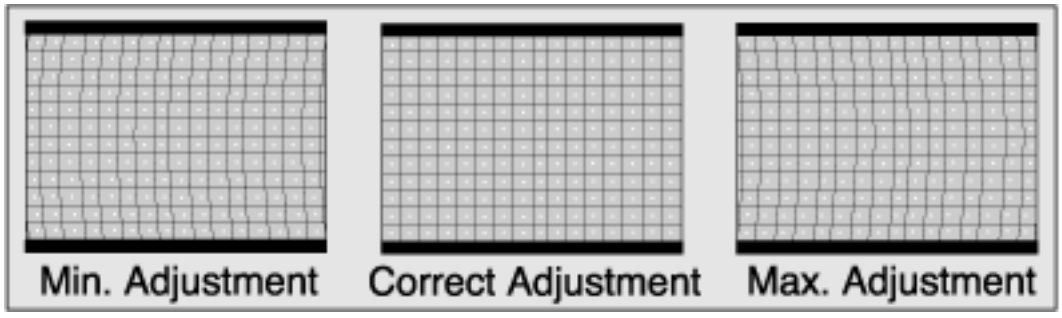
TOP PREVIOUS NEXT

PREPARATION

1. Apply a 480p pattern
2. Set mode to 16x9 in set-up menu
3. Normalize the picture settings.
4. Set picture mode to VIVID

PROCEDURE

1. Enter service mode, select SIDE and adjust so that lines at right and left are vertical like solid line.



TOP PREVIOUS NEXT

15.9.15 (480i/480p 16:9 and 480i/480p split) PCC adjustment

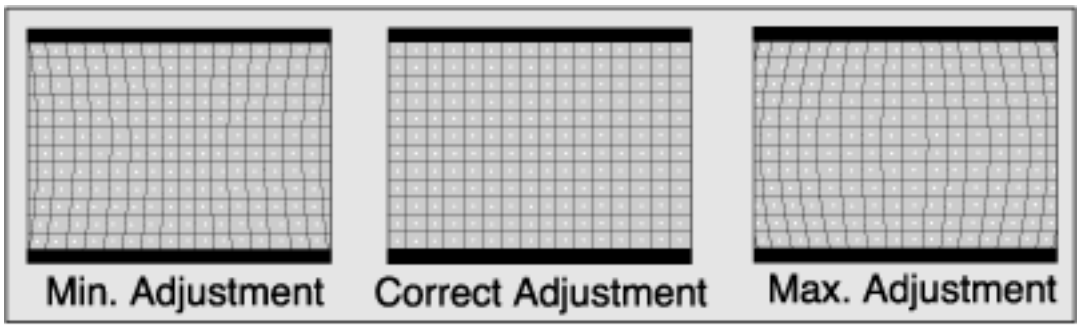
TOP PREVIOUS NEXT

PREPARATION

1. Apply a 480p pattern
2. Set mode to 16x9 in set-up menu
3. Normalize the picture settings.
4. Set picture mode to VIVID

PROCEDURE

1. Confirm that trapezoid adjustment is done.
2. Adjust PCC DATA so that the 1st line and 3rd line make a good balance



NOTE

If side and lower side is imbalanced, adjust PCCHG and PCCLG so that PCC make good balance.

TOP PREVIOUS NEXT

15.9.16 (480i/480p 16:9 and 480i/480p split) Corner PCC adjustment

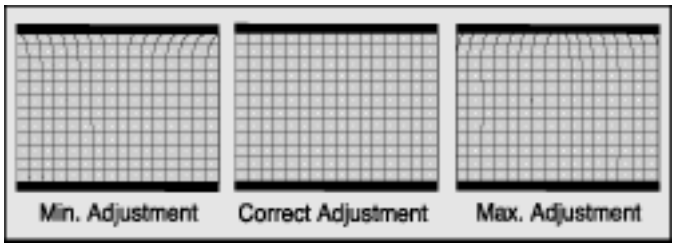
TOP PREVIOUS NEXT

PREPARATION

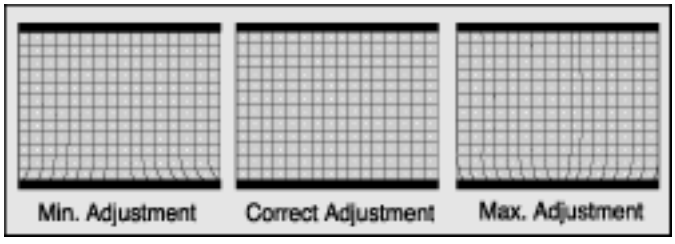
1. Apply a 480p pattern
2. Set mode to 16x9 in set-up menu
3. Normalize the picture settings.
4. Set picture mode to VIVID

PROCEDURE

1. To adjust upper and lower linearity.
2. Adjust TOPG to straighten upper lines



3. Adjust BTMG to straighten lower lines



NOTE

If TOP-BOTTOM bending point is not so good, adjust TOPSL and BTMSL of slice level.

TOP PREVIOUS NEXT

15.9.17 1080i letter and split) H-Center adjustment

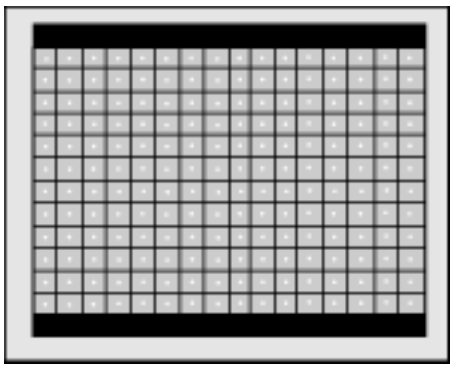
TOP PREVIOUS NEXT

PREPARATION

1. Apply a 1080i pattern.
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

1. If horizontal linearity is poor, in service mode, adjust data H LIN



2. Apply a pattern to center the picture.
3. If the horizontal center is not aligned, in service mode adjust H POS DATA to adjust the horizontal center of the monoscope pattern to the CRT center.

TOP PREVIOUS NEXT

15.9.18 (1080i letter and split) Vertical linearity(V-C) and V-Position adjustment

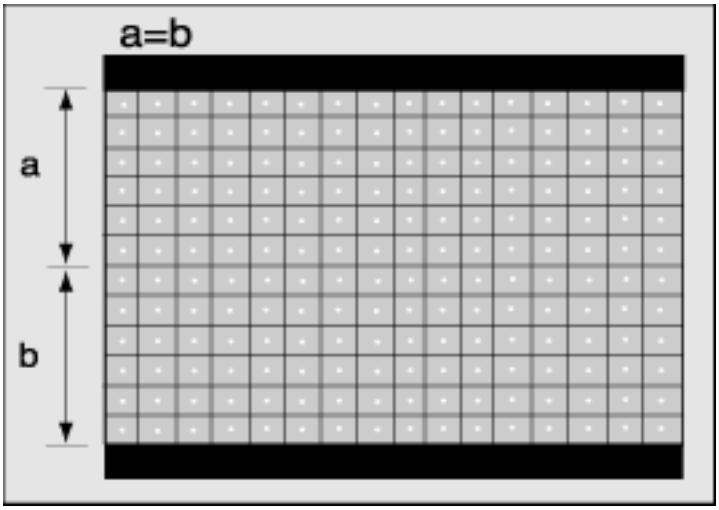
TOP PREVIOUS NEXT

PREPARATION

1. Apply a 1080i pattern.
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

1. Enter service mode, select DAC adjustment
   V-RAS and adjust pattern to center vertical position to the CRT center.
2. Adjust linearity data V-C so that interval of a is same as b (a=b).



3. If the v-position is not at the CRT center, adjust again.

TOP PREVIOUS NEXT

15.9.19 (1080i letter and split) V-S, V-Size adjustment

TOP PREVIOUS NEXT

PREPARATION

1. Apply a 1080i pattern
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

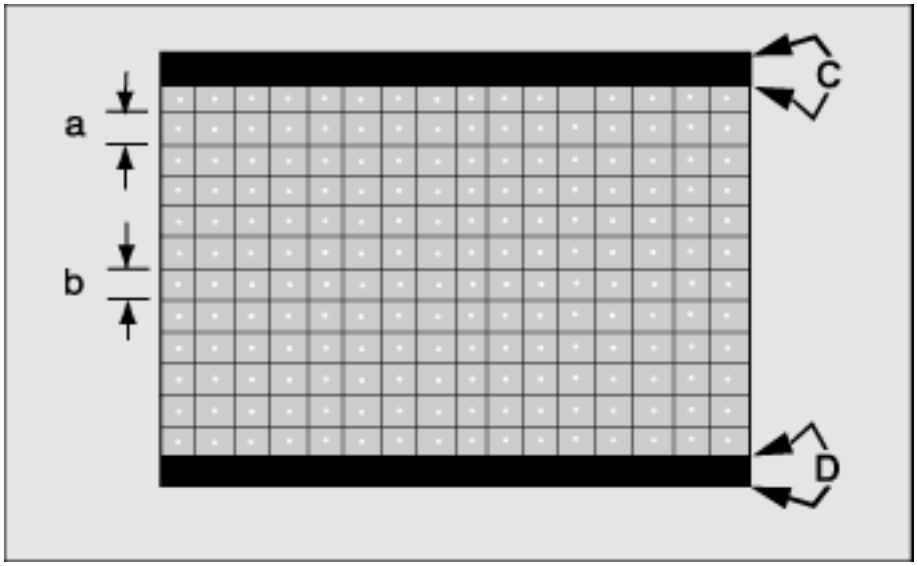
1. Enter to service mode
2. Adjust VAMP so that width C and D becomes 60mm
3. Check a and b sizes, If b-a < -1.5mm (in top and bottom extending case)
    - Increase V-S DATA by one step
    - Adjust VEAMP so that width C and D becomes 60mm.

      NOTE

      Repeat until b-a ± 1.5mm
4. Check a and b sizes, If b-a > -1.5mm (in top and bottom extending case)
    - Decrease V-S DATA by one step
    - Adjust VEAMP so that width C and D becomes 60mm.

      NOTE

      Repeat until b-a ± 1.5mm



TOP PREVIOUS NEXT

15.9.20 (1080i letter and split) Trapezoid adjustment

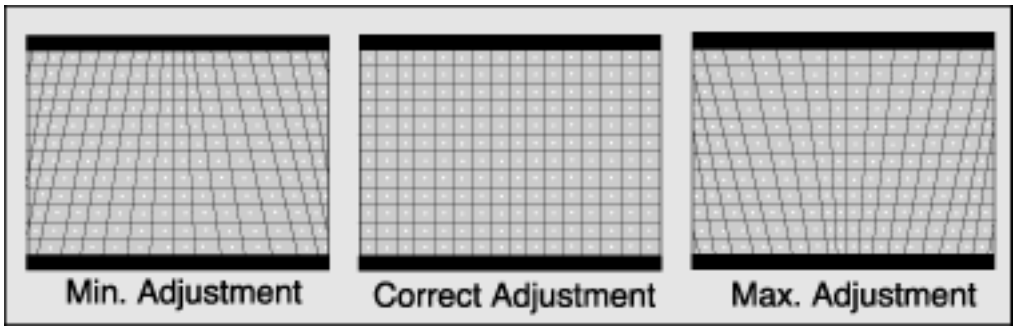
TOP PREVIOUS NEXT

PREPARATION

1. Apply a 1080i pattern
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

1. Enter service mode, select TRAP and adjust DATA so that lines at right and left are vertical like a solid line



TOP PREVIOUS NEXT

15.9.21 (1080i letter and split) Parallelogram adjustment

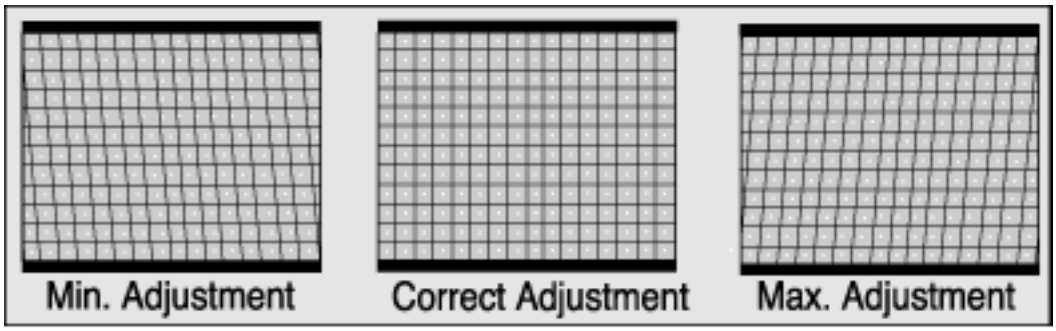
TOP PREVIOUS NEXT

PREPARATION

1. Apply a 1080i pattern
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

1. Enter service mode, select PARA and adjust so that the lines at right and left are vertical like solid line.



TOP PREVIOUS NEXT

15.9.22 (1080i letter and split) PCC adjustment

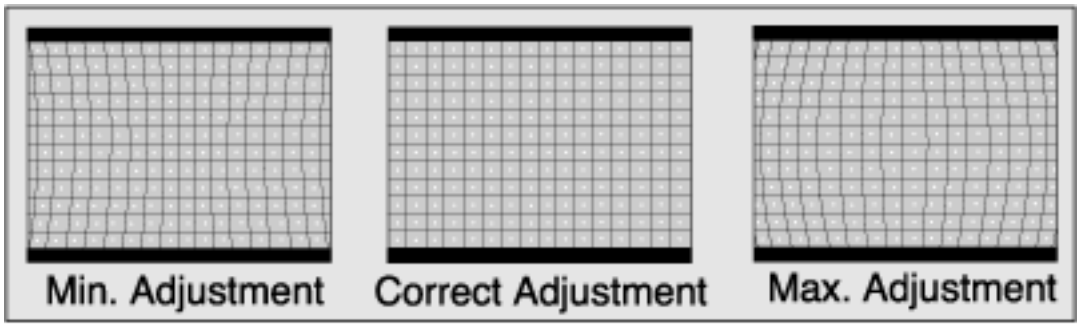
TOP PREVIOUS NEXT

PREPARATION

1. Apply a 1080i pattern
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

1. Confirm that trapezoid adjustment is done.
2. Adjust PCC DATA so that the 1st line and 3rd line make a good balance



NOTE:

If upper and lower side is unbalaced, adjust PCCHG and PCCLG so that PCC make good balance.

TOP PREVIOUS NEXT

15.9.23 (1080i letter and split) Corner PCC adjustment

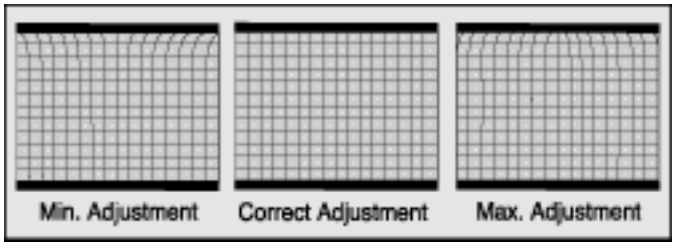
TOP PREVIOUS NEXT

PREPARATION

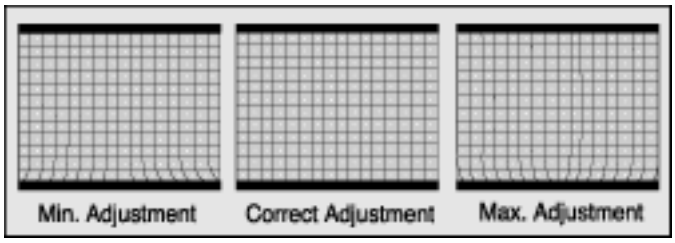
1. Apply a 1080i pattern
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

1. To adjust upper and lower linearity.
2. Adjust TOPG to straighten upper lines



3. Adjust BTMG to straighten lower lines



NOTE

If TOP-BOTTOM bending point is not so good, adjust TOPSL and BTMSL of slice level.

TOP PREVIOUS NEXT

15.9.24 (1080i letter and split) E-W PCC adjustment

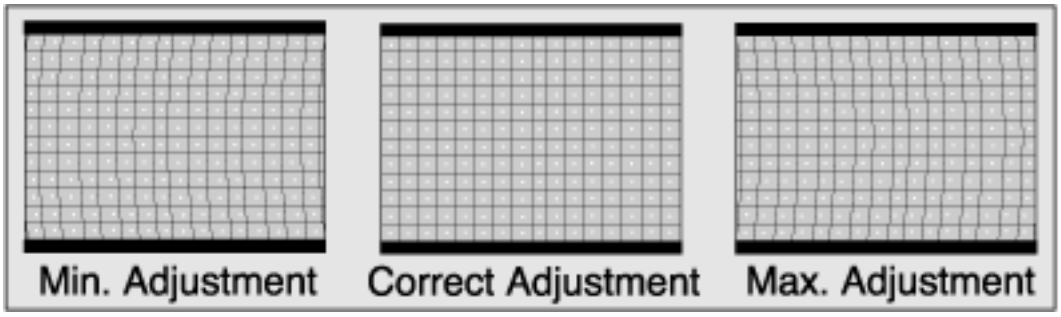
TOP PREVIOUS NEXT

PREPARATION

1. Apply a 1080i pattern
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

1. Confirm that trapezoid adjustment is done.
2. Adjust SIDE DATA so that the lines at left and right become vertical



TOP PREVIOUS NEXT

15.9.25 (1080i letter and split) H-Width adjustment

TOP PREVIOUS NEXT

PREPARATION

1. Use a pattern that permits centering the image
2. Apply a 1080i pattern
3. Normalize the picture settings.
4. Set picture mode to VIVID

PROCEDURE

1. Adjust H WID DATA so that left width and right become in good balance (not too wide or narrow).

TOP PREVIOUS NEXT

15.9.26 (1080i full)
H-Size, V-SIZE adjustment

TOP PREVIOUS NEXT

PREPARATION

1. Use a pattern that permits centering the image
2. Apply a 1080i pattern
3. Set mode to 4x3 in set-up menu
4. Normalize the picture settings.
5. Set picture mode to VIVID

PROCEDURE

1. Adjust H WID and HPOS DATA so that left width and right become in good balance (not too wide or narrow and centered).
2. Adjust VEAMP and VRAS DATA so that upper h and lower become in good balance (not too wide or narrow and centered)

TOP PREVIOUS NEXT

15.9.27 (1080i full) Vertical linearity(V-C) and V-Position adjustment

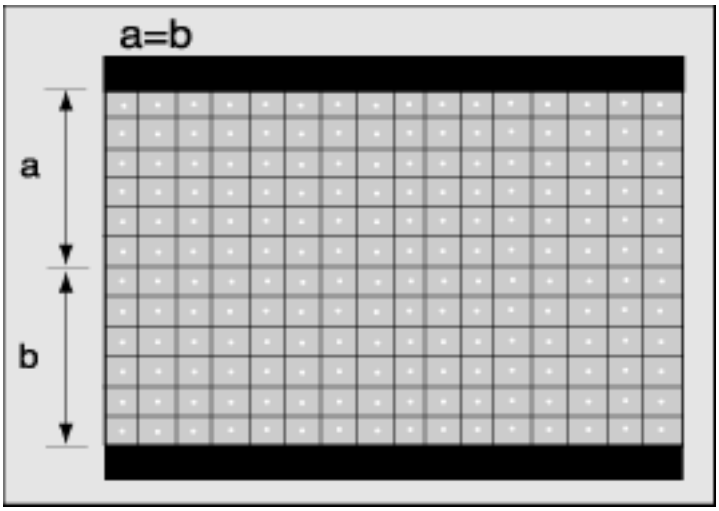
TOP PREVIOUS NEXT

PREPARATION

1. Use a pattern that permits centering the image
2. Apply a 1080i pattern
3. Set mode to 4x3 in set-up menu
4. Normalize the picture settings.
5. Set picture mode to VIVID

PROCEDURE

1. Enter service mode, select DAC adjustment
   VRAS and adjust pattern to center vertical position to the CRT center.
2. Adjust linearity data V-C so that interval of a is same as b (a=b).



3. If the v-position is not at the CRT center, adjust again.

TOP PREVIOUS NEXT

15.9.28 (1080i full)
V-S, V-Size adjustment

TOP PREVIOUS NEXT

PREPARATION

1. Use a pattern that permits centering the image
2. Apply a 1080i pattern
3. Set mode to 4x3 in set-up menu
4. Normalize the picture settings.
5. Set picture mode to VIVID

PROCEDURE

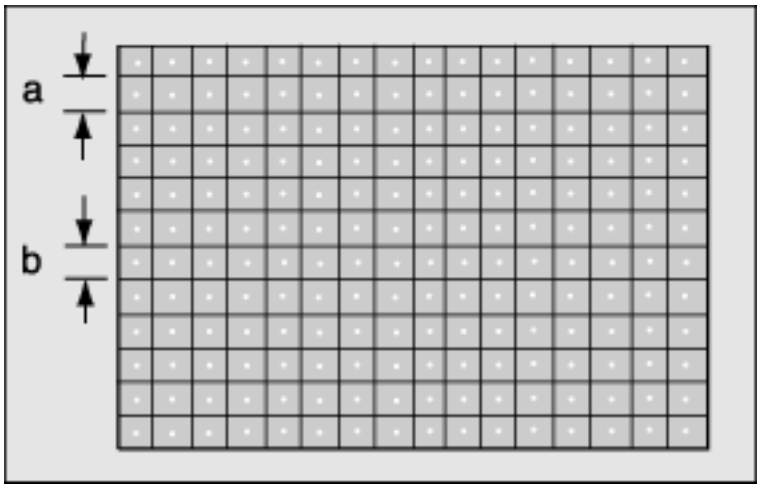
1. Enter to service mode
2. Adjust VAMP to correct vertical size.
3. Check a and b sizes, If b-a < -1.5mm (in top and bottom extending case)
    - Increase V-S DATA by one step
    - Adjust VEAMP to correct vertical size.

      NOTE

      Repeat until b-a ± 1.5mm
4. Check a and b sizes, If b-a > -1.5mm (in top & bottom shortening case)
    - Decrease V-S by one step.
    - Adjust VEAMP to correct vertical size

      NOTE

Repeat until b-a ± 1.5mm



TOP PREVIOUS NEXT

15.9.29 (1080i full) Trapezoid adjustment

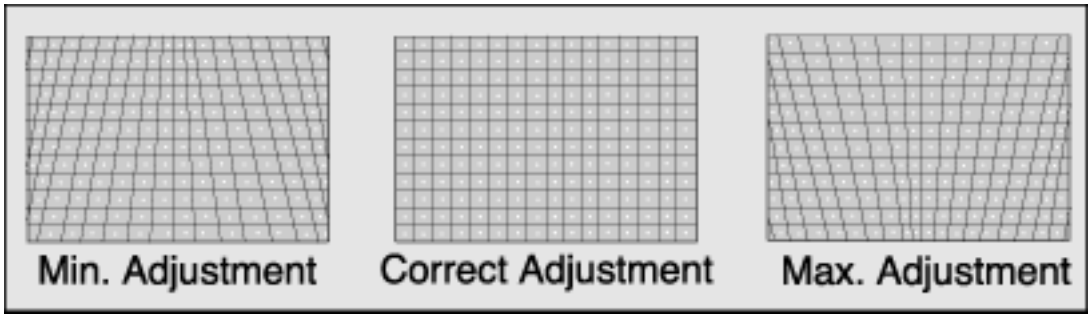
TOP PREVIOUS NEXT

PREPARATION

1. Apply a 1080i pattern
2. Set mode to 4x3 in set-up menu
3. Normalize the picture settings.
4. Set picture mode to VIVID

PROCEDURE

1. Enter service mode, select TRAP and adjust DATA so that lines at right and left are vertical like a solid line



TOP PREVIOUS NEXT

15.9.30 (1080i full) Parallelogram adjustment

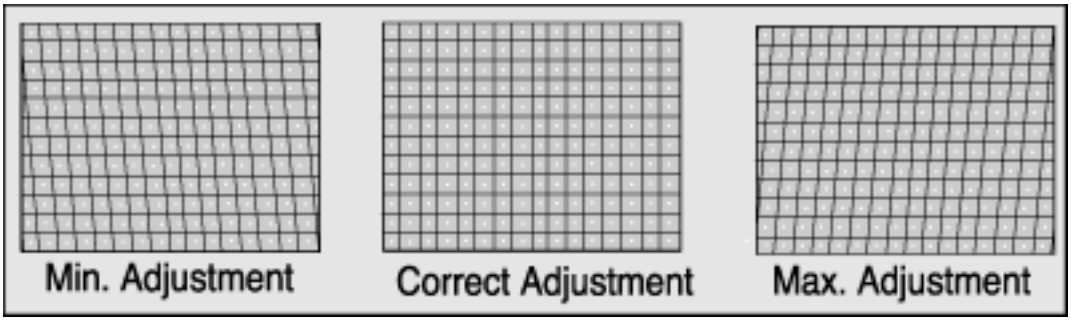
TOP PREVIOUS NEXT

PREPARATION

1. Apply a 1080i pattern
2. Set mode to 4x3 in set-up menu
3. Normalize the picture settings.
4. Set picture mode to VIVID

PROCEDURE

1. Enter service mode, select PARA and adjust so that the lines at right and left are vertical like solid line.



TOP PREVIOUS NEXT

15.9.31 (1080i full) E-W PCC adjustment

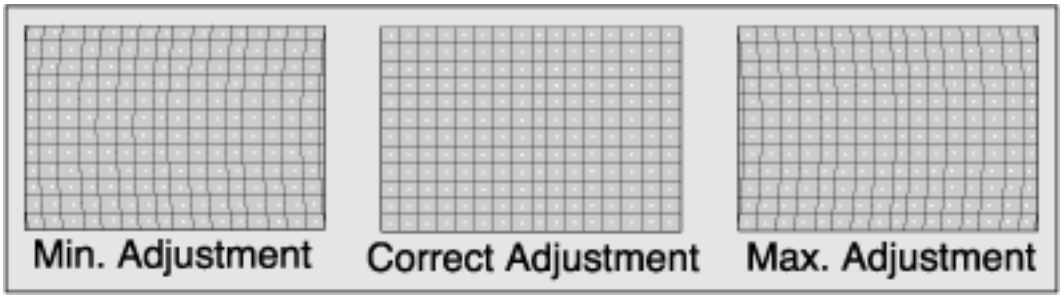
TOP PREVIOUS NEXT

PREPARATION

1. Apply a 1080i pattern
2. Set mode to 4x3 in set-up menu
3. Normalize the picture settings.
4. Set picture mode to VIVID

PROCEDURE

1. Confirm that trapezoid adjustment is done.
2. Adjust SIDE DATA so that the lines at left and right become vertical



TOP PREVIOUS NEXT

15.9.32 (1080i full) Corner PCC adjustment

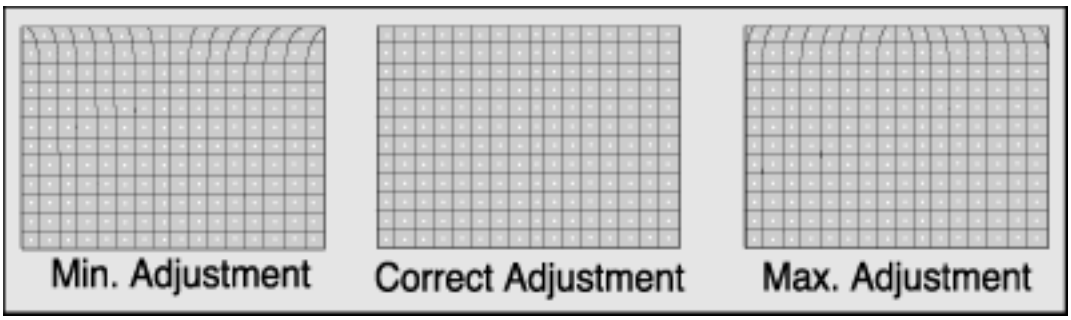
TOP PREVIOUS NEXT

PREPARATION

1. Apply a 1080i pattern
2. Set mode to 4x3 in set-up menu
3. Normalize the picture settings.
4. Set picture mode to VIVID

PROCEDURE

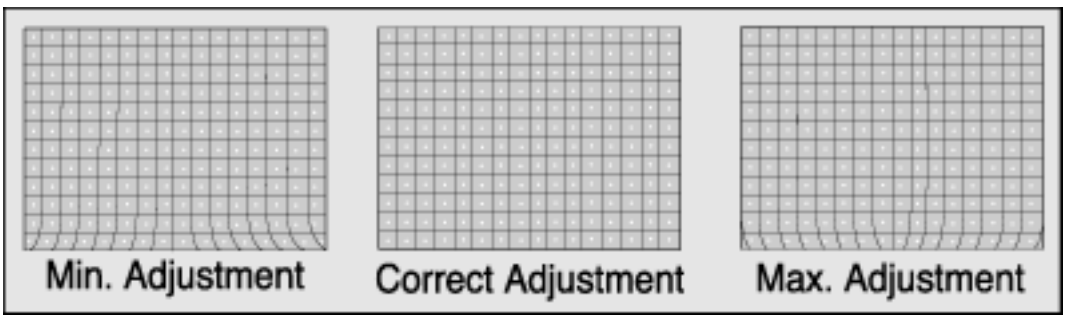
1. To adjust upper and lower linearity.
2. Adjust TOPG to straighten upper lines



3. Adjust BTMG to straighten lower lines

NOTE

If TOP-BOTTOM bending point is not so good, adjust TOPSL and BTMSL of slice level.



TOP PREVIOUS NEXT

15.10 MTS circuit adjustmens

TOP PREVIOUS NEXT

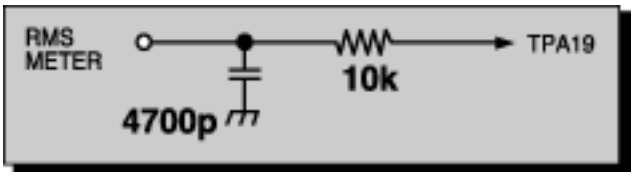
The MTS circuit adjustments require two steps:

1. Input level adjustment.
2. Stereo separation adjustment.

Input level adjustment
Service DAC adjustment (MTSIN)

PREPARATION

1. Connect an RMS meter with filter jig as shown in figure to TPA19 (L_OUT)



2. Connect an RF signal generator to the RF antenna input.

PROCEDURE

1. Apply the following signal from the RF signal generator:
    - Video: 100 IRE flat field, 30% modulation.
    - Audio: 300Hz, 100% modulation, monaural (70 ±5dB, 75Ω OPEN, P/S 10dB). Make sure that the 75μs pre-emphasis is OFF.
2. Adjust the MTS input level adjustment MTSIN data until the RMS voltage measured is 106 ± 6.0mVrms.

Stereo separation adjustment (SEPAH)

PREPARATION

1. Connect an R.F. signal generator to the RF antenna input.
2. Connect a scope to TPA20.

PROCEDURE

1. Select stereo mode in audio menu

2. Apply the following signal from the RF signal generator:

    - Video: 100 IRE flat field, 30% modulation.

    - Audio: 300Hz, 30% modulation, stereo (left only) (70±5dB, 75Ω OPEN, P/S 10dB).

      NOTE

      After setting 30% modulation with P.L. SW and N.R. SW OFF, turn P.L. SW and N.R. SW ON.

3. In service mode, adjust the MTS Low-Level separation adjustment SEPAL data until the amplitude displayed on the scope is minimum.

4. Apply the following signal from the RF signal generator:

    - Video: 100 IRE flat field, 30% modulation

    - Audio: 3KHz, 30% modulation, stereo (left only) (70 ±5dB, 75Ω OPEN, P/S 10dB).

      NOTE

      After setting 30% modulation with P.L. SW and N.R. SW OFF, turn P.L. SW and N.R. SW ON.

5. Adjust the MTS High-level separation adjustment SEPAH until the amplitude displayed on the scope is minimum.

6. Repeat above steps 2 through 5 until the amplitude is at minimum for both signals.

TOP PREVIOUS NEXT

15.11 Clock adjustment (CLOCK)

TOP PREVIOUS NEXT

PREPARATION

Connect the frequency counter from TP96
(A13 pin 14) to cold ground

PROCEDURE

1. Turn the receiver OFF with the A.C. power applied.
2. Measure TP96 (A13 pin 14) for the frequency of the waveform and record the reading.

   NOTE

3. TP96 (A13 pin 14) measurement must have at least four digits of resolution following the decimal point. Example: 000.0000
4. Place the receiver into service mode for making electronic adjustment, select the clock adjustment DAC CLOCK .
5. Calculate and set CLOCK based on the following formula:

$$CLOCK = 128 + (0.450)\times 10^{6}\frac{\{(732.4220) - TP96[\mathrm{Hz}]\}}{(732.4220)}$$

   NOTE

   TP96 (A23 pin 21) measurement will not change regardless of the value stored in CLOCK.

TOP PREVIOUS NEXT

15.12 Service Adjustments Mechanical Controls

TOP PREVIOUS NEXT

WIDTH CORRECTION ADJUSTMENT

Note

Perform this adjustment only when FBT is changed.

Preparation

Connect the DVM (digital voltage meter) (+) lead to connector D10 pin-2 or TPQ27; and (-) lead to connector D10 pin-4.

Procedure

1. Apply a black pattern.
2. Adjust R524 on D-Board so that the voltage on connector D10 pin-2 or TPQ27 is 1.8±0.1V on D-Board.

FOCUS (PART OF T551)

Preparation

Apply a crosshatch pattern with dots.

Procedure

1. Adjust the FOCUS control to obtain the sharpest and clearest dot pattern.
    - F1 focus control adjusts vertically.
    - F2 focus control adjusts horizontally.
    - Use this two controls to adjust focus, until best overall picture is obtained.

TOP PREVIOUS NEXT

16 Identification of components

TOP PREVIOUS NEXT

16.1 TV with back cover removed

16.2 A-Board

16.3 D-Board

16.4 L-Board

16.5 DG-Board top

16.6 G-Board bottom

16.7 DF-Board

16.8 K-Board

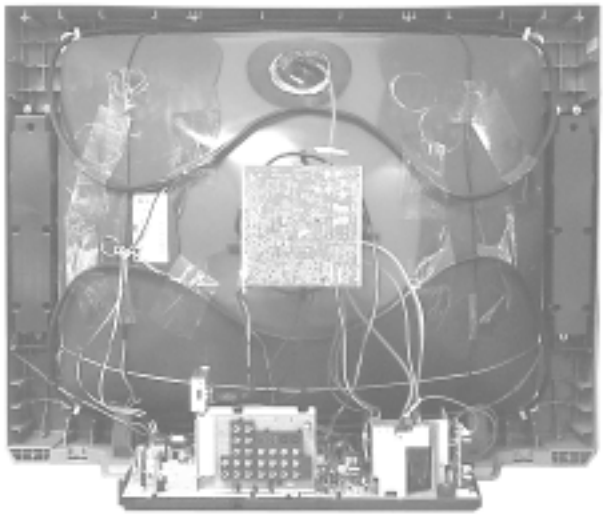
16.9 H-Board

TOP PREVIOUS NEXT

16.1 TV with back cover removed

TOP PREVIOUS NEXT

TV View with back cover removed

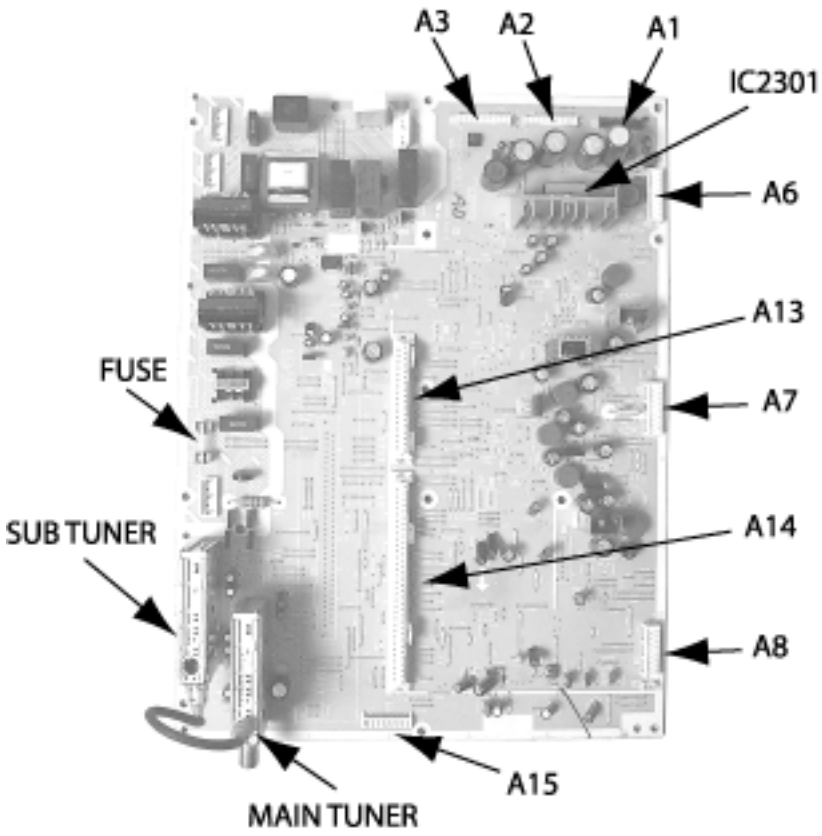


TOP PREVIOUS NEXT

16.2 A-Board

TOP PREVIOUS NEXT

A-Board view

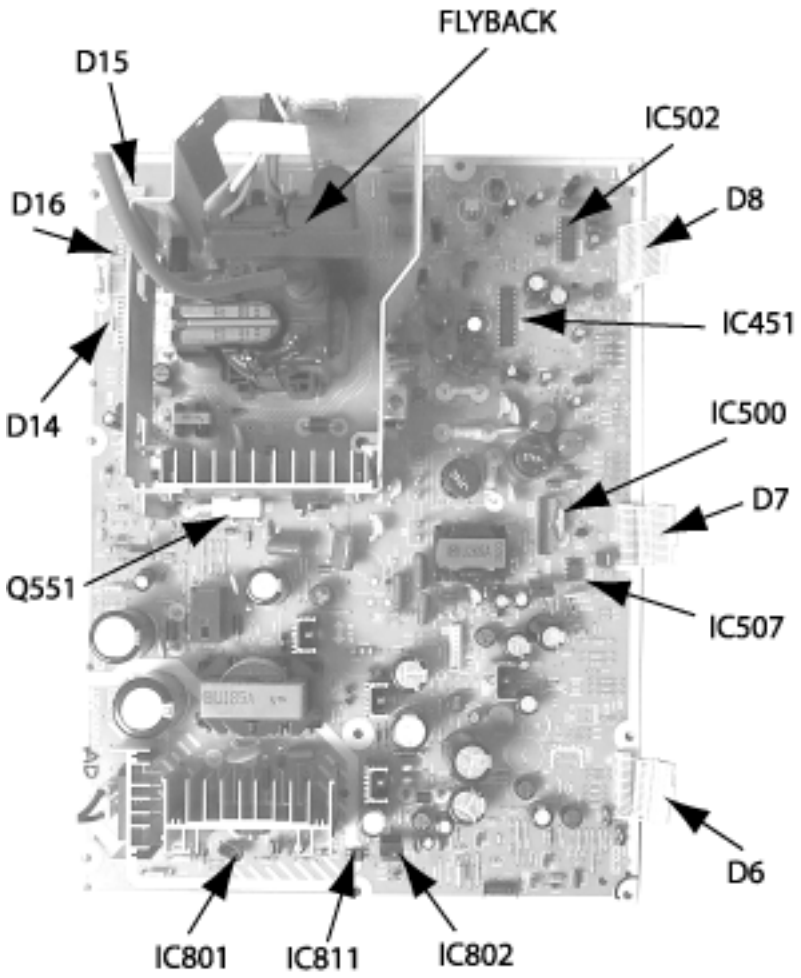


TOP PREVIOUS NEXT

16.3 D-Board

TOP PREVIOUS NEXT

D-Board view

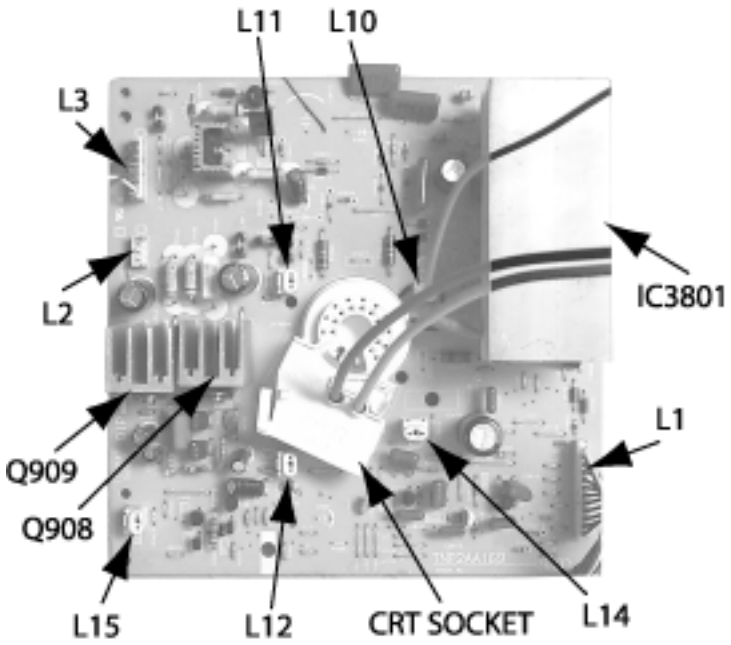


TOP PREVIOUS NEXT

16.4 L-Board

TOP PREVIOUS NEXT

L-Board view

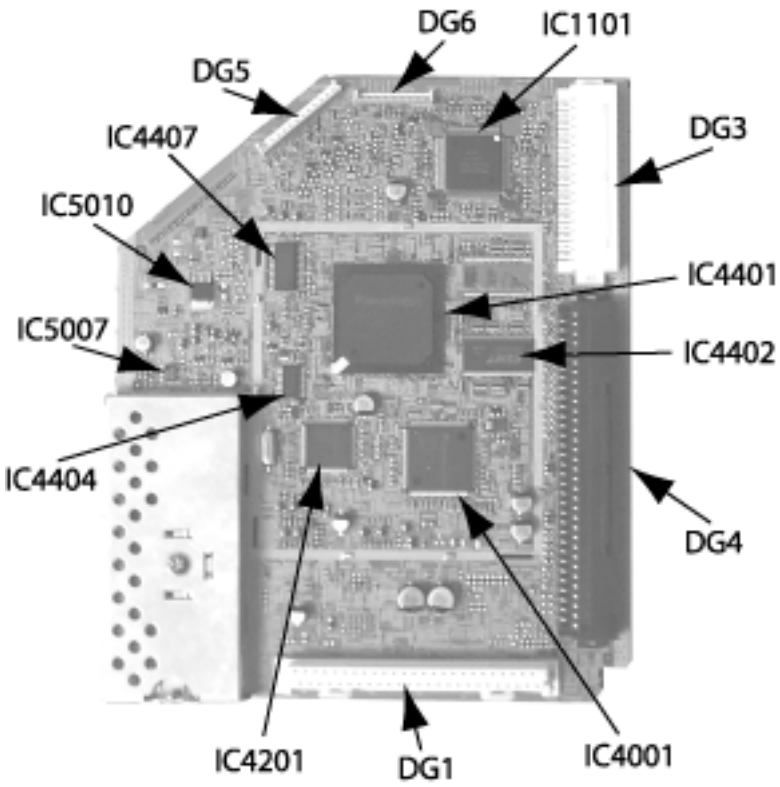


TOP PREVIOUS NEXT

16.5 DG-Board top

TOP PREVIOUS NEXT

DG-Board top view



NOTE:

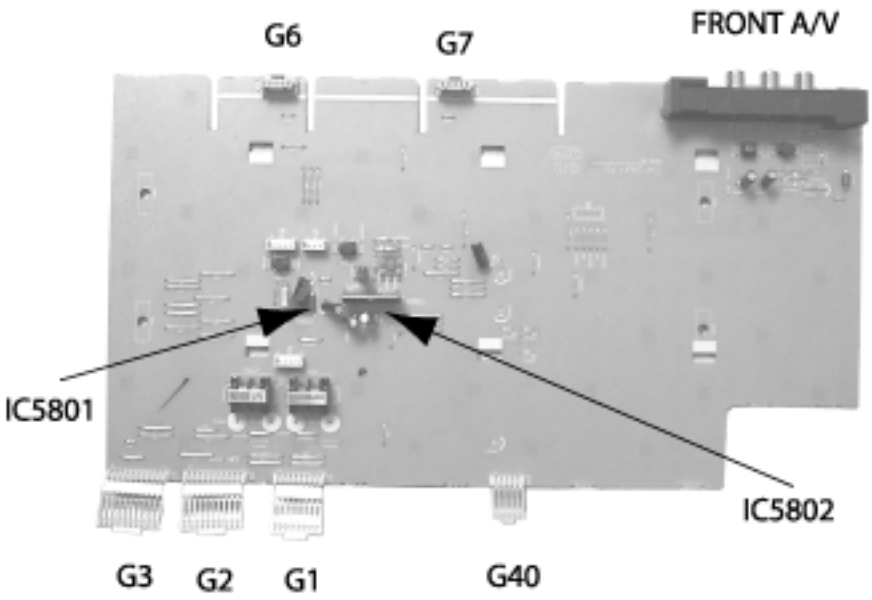
Please ADD 4 to all IC part numbers, EXAMPLE: On board is IC506, then by adding 4 is IC4506

TOP PREVIOUS NEXT

16.6 G-Board bottom

TOP PREVIOUS NEXT

G-Board

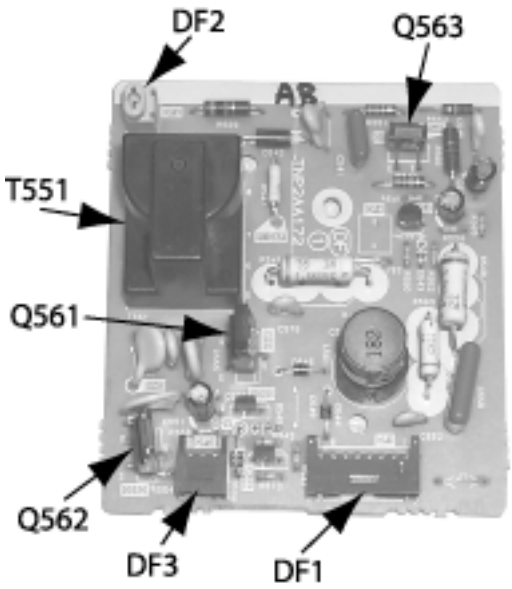


TOP PREVIOUS NEXT

16.7 DF-Board

TOP PREVIOUS NEXT

DF-Board view

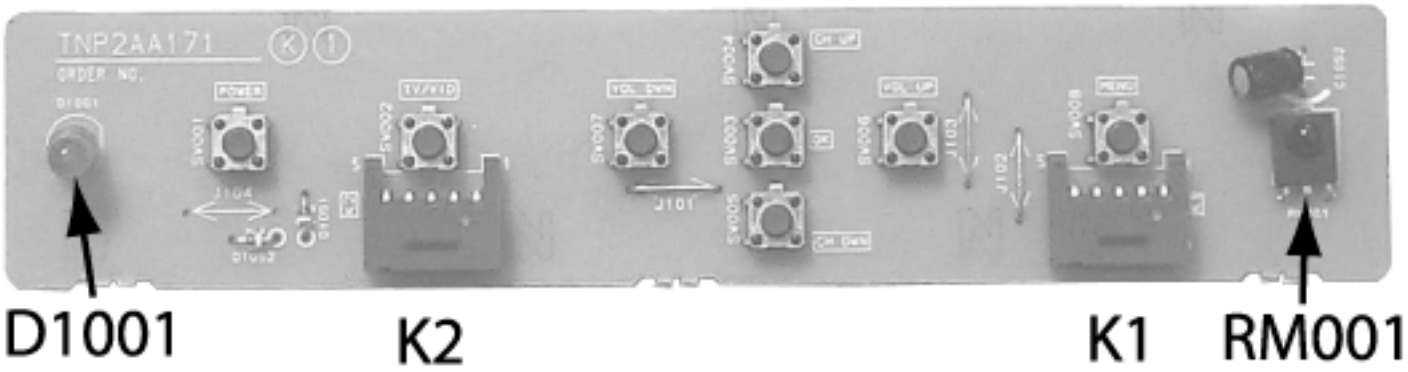


TOP PREVIOUS NEXT

16.8 K-Board

TOP PREVIOUS NEXT

K-Board view



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16.9 H-Board

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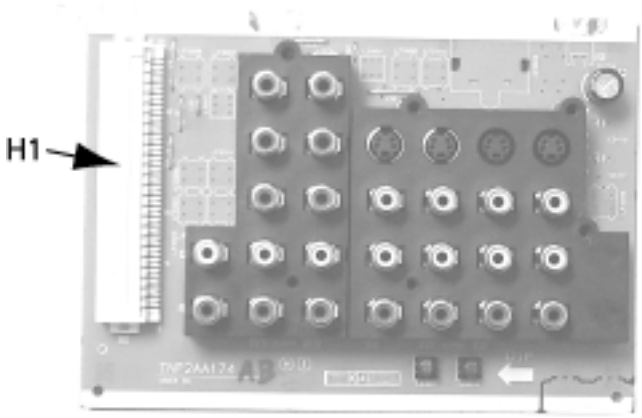
H-Board view



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17 Reference of PDF links color

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DESCRIPTION OF PDF LINK COLORS	
TYPE	DESTINATION
SCHEMATIC	
YELLOW ON IC	IC ON PCB
YELLOW ON CONNECTOR	CONNECTOR ON PCB
YELLOW ON SCHEMATIC	PCB
CYAN	WAVEFORM
GREEN ON SIDE	SCHEMATIC CONTINUED
GREEN ON CONNECTOR	CONNECTOR CONNECTION
BLUE ON IC	VOLTAGE
PCB	
BLUE ON IC	IC ON SCHEMATIC
BLUE ON CONNECTOR	CONNECTOR ON SCHEMATIC
BLUE ON PCB	SCHEMATIC
GREEN ON SIDE	PCB CONTINUED
BLOCK DIAGRAMS	
GREEN ON IC	IC ON SCHEMATIC
GREEN ON SIDE	BLOCK DIAGRAM CONTINUED

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18 Conductor Views

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18.1 A-Board 1 of 2

18.2 A-Board 2 of 2

18.3 D-Board 1 of 2

18.4 D-Board 2 of 2

18.5 H-Board

18.6 DF-Board

18.7 G-Board 1 of 2

18.8 G-Board 2 of 2

18.9 L-Board

18.10 K-Board

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18.1 A-Board 1 of 2

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18.2 A-Board 2 of 2

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18.3 D-Board 1 of 2

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TOP PREVIOUS NEXT

18.4 D-Board 2 of 2

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TOP PREVIOUS NEXT

18.5 H-Board

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TOP PREVIOUS NEXT

18.6 DF-Board

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TOP PREVIOUS NEXT

18.7 G-Board 1 of 2

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TOP PREVIOUS NEXT

18.8 G-Board 2 of 2

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TOP PREVIOUS NEXT

18.9 L-Board

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18.10 K-Board

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19 Block Diagrams

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19.1 Audio Block Diagram

19.2 Video Block Diagram

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19.1 Audio Block Diagram

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TOP PREVIOUS NEXT

19.2 Video Block Diagram

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20 Schematic Diagrams

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20.1 Schematic notes in english

20.2 Schematic notes in spanish

20.3 A-Board schematic 1 of 4

20.4 A-Board schematic 2 of 4

20.5 A-Board schematic 3 of 4

20.6 A-Board schematic 4 of 4

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20.9 D-Board schematic 3 of 5

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20.11 D-Board schematic 5 of 5

20.12 DG-Board schematic 1 of 11

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20.14 DG-Board schematic 3 of 11

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20.20 DG-Board schematic 9 of 11

20.21 DG-Board schematic 10 of 11

20.22 DG-Board schematic 11 of 11

20.23 DF-Board schematic 1 of 2

20.24 L-Board schematic 1 of 2

20.25 L-Board schematic 2 of 2

20.26 G-Board schematic 1 of 2

20.27 G-Board schematic 2 of 2

20.28 H-Board schematic

20.29 K-Board schematic

20.30 Voltages

20.31 Waveforms

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20.1 Schematic notes in english

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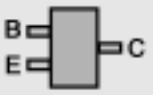
Notes:

IMPORTANT SAFETY NOTICE

THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES THAT ARE IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURERS SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS DESIGNATED WITH A ⚠ IN THE SCHEMATIC.

CHIP TRANSISTOR LEAD DESIGNATION



SCHEMATIC NOTES

1. Resistors are carbon 1/4W unless noted otherwise.
2. Capacitors are ceramic 50V unless noted otherwise.
3. Coil value notes is inductance in µH.
4. Test point indicated by ; Test point but no pin .
5. Components indicated with ⚠ are critical parts and replacement should be made with manufacture specified replacement parts only.
6. ▬ (**BOLD LINE**) indicates the route of B+ supply.
7. The schematic diagrams are current at the time of printing and are subject to change without notice.
8. Ground symbol ⏚ indicates **HOT GROUND CONNECTION**; ⏚ indicates COLD GROUND.

NOTE: All other component symbols are used for engineering design purposes.

VOLTAGE MEASUREMENTS

1. Voltage measurement:
   - AC input to the Receiver is 120V. NTSC (HD, 1125i & 525P when applicable) signal generator is connected to the antenna of the Receiver. (Color bar pattern of 100 IRE white and 7.5 IRE black.)
   - All Picture and Audio adjustments are set to Normalize.
     TV ANT/CABLE - (Set-Up Menu) in TV/ANT Mode
     Volume - Min.
     TV/Video SW - TV position
     Audio Mode - Stereo
   - Voltage readings are nominal and may vary ±10% on active devices. Some voltage reading will vary with signal strength and picture content.
   - Supply voltages are nominal.
2. Ground symbol ⏚ indicates ground lead connection of meter.
   Incorrect ground connection will result in erroneous readings.

*CAUTION: **Incorrect ground connection of the test equipment will result in erroneous readings.***

WAVEFORM MEASUREMENTS

1. ③ indicates waveform measurement. (Measurement can be taken at the best accessible location in common to the indicated point.)
2. Taken with an NTSC signal generator connected to the antenna terminal. (NTSC color bar pattern of 8 bars of EIA colors, 100 IRE white and 7.5 IRE black.)
3. Customer Controls (Picture/Audio Menu) are set to Normalize. Volume is set to "MIN".
4. All video and color waveforms are taken with a wideband scope and a probe with low capacitance (10 to 1). Shape and peak altitudes may vary depending on the type of Oscilloscope used and its settings.
5. Ground symbol ⏚ shown on waveform number indicates (Hot) ground lead connection of the Oscilloscope.

CAUTION: Incorrect ground connection of the test equipment will result in erroneous readings.

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20.2 Schematic notes in spanish

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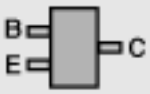
Notas

NOTA DE SEGURIDAD

LOS DIAGRAMAS ELÉCTRICOS INCLUYEN CARACTERÍSTICAS ESPECIALES MUY IMPORTANTES PARA LA PROTECCIÓN CONTRA RAYOS-X, QUEMADURAS Y DESCARGAS ELÉCTRICAS. CUANDO SE DE SERVICIO ES IMPORTANTE USAR PARA REEMPLAZO DE COMPONENTES CRITICOS, SOLO PARTES ESPECIFICADAS POR EL FABRICANTES. LOS COMPONENTES CRITICOS ESTAN SEÑALADOS EN LOS DIAGRAMAS POR EL SIMBOLO ⚠.

IDENTIFICACIÓN DE TERMINALES PARA TRANSISTORES EN *CHIP*



NOTAS DE LOS DIAGRAMAS

1. Las Resistencias son de Carbón de 1/4W, a menos que se indique otra característica.
2. Los Capacitores son de Cerámica para 50V, a menos que se indique otra característica.
3. El valor indicado de las Bobinas es la inductancia expresada en µH.
4. Los puntos de prueba en la terminal de algún componente son indicados por ● Los puntos de prueba fuera de los componentes se indican con ●.
5. Los componentes señalados con el símbolo ⚠ son considerados componentes críticos y deben ser reemplazados sólo con las partes especificadas por el fabricante.
6. ▬ (**LINEA GRUESA**) indica las líneas de alimentación de los Voltajes B+.
7. Los diagramas eléctricos están sujetos a cambio sin previo aviso.
8. El símbolo ⏚ indica que es una conexión a **Tierra Caliente** y el símbolo ⏚ indica conexión a **Tierra Fría**.

NOTA: Los demas símbolos de componentes incluidos son usados con fines de diseño.

MEDICIÓN DE VOLTAJES

1. Medición de voltaje:
   - El voltaje de entrada al Receptor es de 120V de Corriente Alterna. Un generador de patrones con formato NTSC se conecta a la entrada de la antena. (Patrón de Barras de Colores con 100 IREs para el Blanco y 7.5 IREs para el Negro.)
   - Los ajustes de los Menus Picture y Audio se normalizan.
     En el Menú Set-Up, en la opción ANTENA, se selecciona el modo de CABLE.
     El nivel de Volumen se minimiza.
     De los modos TV y Video, seleccionar el modo TV.
     Seleccionar modo Estereo del Audio.
   - Las mediciones de los voltajes son nominales y pueden variar hasta 10% en componentes en funcionamiento. Las lecturas de los voltajes pueden variar por la potencia de la señal y el contenido de la imagen.
   - Las fuentes de voltajes son nominales.
2. El símbolo ⏚ indica el tipo de tierra que se utiliza en la conexión del medidor.

PRECAUCION: Si no se utiliza la conexión a la tierra adecuada, se obtendrán mediciones equivocadas y podría dañar el equipo de medición.

MEDICIÓN DE FORMAS DE ONDA

1. Un símbolo como ③ indica el punto para medir una señal. (La medición puede hacerse en el punto con mayor accesibilidad, siempre que sea común al indicado.)
2. Se midieron utilizando un generador con formato NTSC conectado a la terminal de la antena. (Patrón de 8 Barras de Colores EAI, formato NTSC de 100 IREs para el Blanco y 7.5 IREs para el Negro.)
3. Los ajustes de usuario de los Menus PICTURE y AUDIO se normalizaron.
4. Las formas de onda se midieron con un osciloscopio de banda alta y con un punta de prueba de baja capacitancia (10 a 1). La forma y amplitud de las ondas puede variar según el tipo de osciloscopio que se utilice y sus caracteristicas.
5. El símbolo de tierra ⏚ que aparece junto al número de la forma de onda, indica que se utiliza conexión a **Tierra Caliente** en el extremo negativo de la punta de prueba.

PRECAUCION: Si no se utiliza la conexión

Blanco y 7.5 IRE's para el Negro.)

3. Los ajustes de usuario de los Menus PICTURE y AUDIO se normalizaron. Posteriormente el nivel de volumen se ajusta al mínimo.
4. Las formas de onda de Video y Color fueron tomadas con un osciloscopio de

el extremo negativo de la punta de prueba.

PRECAUCION: Si no se utiliza la conexión a la tierra adecuada, se obtendrán mediciones equivocadas y podría dañar el equipo de medición.

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20.5 A-Board schematic 3 of 4

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20.6 A-Board schematic 4 of 4

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20.7 D-Board schematic 1 of 5

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20.9 D-Board schematic 3 of 5

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20.10 D-Board schematic 4 of 5

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20.11 D-Board schematic 5 of 5

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20.12 DG-Board schematic 1 of 11

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20.25 L-Board schematic 2 of 2

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20.27 G-Board schematic 2 of 2

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20.28 H-Board schematic

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20.29 K-Board schematic

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20.30 Voltages

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20.31 Waveforms

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21 Parts Location

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22 Parts list

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22.1 Description of abbreviations guide

22.2 Parts list

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22.1 Description of abbreviations guide

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Important Safety Notice

Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use manufacturer's specified parts.

Abbreviation of part name and description

1. Resistor

Example :
ERD25TJ104 **C** 100KΩ, **J**, 1/4W
Type Allowance

Type	Allowance
C : Carbon	F : ± 1%
F : Fuse	G : ± 2%
M : Metal Oxide Metal Film	J : ± 5% K : ± 10%
S : Solid	M : ± 20%
W : Wire Wound	

2. Capacitor

Example :
ECKF1H103ZF **C** 0.01µF, **Z**, 50V
Type Allowance

Type	Allowance
C : Carbon	C : ± 0.25pF
E : Electrolytic	D : ± 0.5pF
P : Polyester Polypropylene	F : ± 1pF G : ± 3%
T : Tantalum	J : ± 5%
	K : ± 10%
	L : ± 15%
	M : ± 20%
	P : ± 100%, -0%
	Z : ± 80%, -20%

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22.2 Parts list

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Ref. No.	Part No.	Part Name & Description	Remarks
CAPACITORS			
C037	ECA0JM222B	CAP,E 2200UF-6.3V	
C038	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	
C047	ECA1HM330B	CAP,E 33UF-50V	
C048	ECA1HMR22B	CAP,E .22UF-50V	
C052	ECA1HM4R7B	CAP,E 4.7UF-50V	
C053	ECA1HM2R2B	CAP,E 2.2UF-50V	
C054	ECA1HM4R7B	CAP,E 4.7UF-50V	
C055	ECA1VM470B	CAP,E 47UF-35V	
C056	ECA1VM471B	CAP,E 470UF-35V	
C059	ECJ2VC1H101J	CAP,C 100PF-J-50V	
C060	ECJ2VC1H101J	CAP,C 100PF-J-50V	
C061	ECA1HMR22B	CAP,E .22UF-50V	
C062	ECA1HM2R2B	CAP,E 2.2UF-50V	
C451	ECA1EM471B	CAP,E 470UF-25V	
C452	ECA1EM471B	CAP,E 470UF-25V	
C453	ECA1HM101B	CAP,E 100UF-50V	
C454	ECQV1H224JL3	CAP,P .22UF-J-50V	
C455	ECA1CM221B	CAP,E 10UF-16V	
C456	ECJ2VB1H472K	CAP,C .0047UF-K-50V	
C457	ECQB1H471JF3	CAP,P 470PF-J-50V	
C458	ECQV1H105JL3	CAP,P 1.0UF-J-50V	
C459	ECQE2104KF3	CAP,P .10UF-K-200V	
C460	ECQE2224KF3	CAP,P .22UF-K-200V	
C461	ECA1HM010B	CAP,E 1UF-50V	
C462	ECA0JM221B	CAP,E 220UF-6.3V	
C463	ECA1VM470B	CAP,E 47UF-35V	
C467	ECQV1H224JL3	CAP,P .22UF-J-50V	
C468	ECJ2VB1H272K	CAP,C .0027UF-K-50V	
C469	ECJ2FB1H104K	CAP,C .1UF-K-50V	
C469	ECQB1H104JF3	CAP,P .10UF-J-50V	
C471	ECQB1H104JF3	CAP,P .10UF-J-50V	
C472	ECA1HM4R7B	CAP,E 4.7UF-50V	

C502	ECJ2VF1H104Z	CAP,C .1UF-Z-50V	
C502	ECQB1H104JF3	CAP,P .10UF-J-50V	
C503	ECJ2VB1H102K	CAP,C .001UF-K-50V	
C505	ECQB1H104JF3	CAP,P .10UF-J-50V	
C507	ECEA2CNR47SB	CAP,E .47UF-160V	
C508	ECQB1H104JF3	CAP,P .10UF-J-50V	
C509	ECKR3D222KBP	CAP,C 2200PF-K-2KVDC	
C510	ECWH20392JVY	CAP,P 3900PF-J-2KV	
C511	ECWH20472JVB	CAP,P 4700PF-J-2KV	
C512	ECA1HMR47B	CAP,E .47UF-50V	
C514	ECQM4472JZW	CAP,P 4700PF-J-400V	
C515	ECKR3A222KBP	CAP,C .0022UF-K-1KV	
C516	ECQB1H223JF3	CAP,P .022UF-J-50V	
C517	ECJ2VG1H151J	CAP,C 150-J-50V	
C518	ECKW3D681KBR	CAP,C 680PF-K-2KV	
C519	ECKW3D681KBP	CAP,C 680PF-K-2KV	
C520	ECKW3D222KBP	CAP,C 2200UF-K-2KV	
C521	ECWF2304JSR	CAP,P .30UF-J-200V	
C523	ECQB1H104JF3	CAP,P .10UF-J-50V	
C524	ECQE1224KF3	CAP,P .22UF-K-100V	
C525	EEUNA1E220B	CAP,E 22UF-25V	
C526	ECQB1H104JF3	CAP,P .10UF-J-50V	
C527	ECQV1H224JL3	CAP,P .22UF-J-50V	
C529	ECQB1H473JF3	CAP,P .047UF-J-50V	
C532	ECQB1H104JF3	CAP,P .10UF-J-50V	
C534	ECQB1H103JF3	CAP,P .01UF-J-50V	
C535	ECQV1H104JL3	CAP,P .10UF-J-50V	
C536	ECEA1EN100UB	CAP,E 10UF-25V	
C537	ECQB1H473JF3	CAP,P .047UF-J-50V	
C538	ECA1CM471B	CAP,E 470UF-16V	
C539	ECA1CM471B	CAP,E 470UF-16V	
C541	ECQE6103RKF	CAP,P.010UF-K-100V	
C543	ECKW3D151KBP	CAP,C 150PF-K-2KV	
C544	ECA1HM010B	CAP,E 1UF-50V	
C545	ECKR3D471KBP	CAP,C 470PF-K-2KV	
C546	ECKW3D102KBR	CAP,C 1000PF-K-2KV	
C547	ECKR3A102KBP	CAP,C 1000PF-K-1KV	
C548	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	
C550	ECCN3A470KGE	CAP,C 47PF-K-1KV	

C551	ECKR3A332KBP	CAP,C 3300PF-K-1KV	
C553	ECA1CM101B	CAP,E 100UF-16V	
C554	ECA1VM101B	CAP,E 100UF-35V	
C555	ECKR3D152KBP	CAP,C .0015UF-K-2KVDC	
C556	ECA1VM470B	CAP,E 47UF-35V	
C558	ECQE2474KF3	CAP,P .47UF-K-200V	
C560	ECA1HM100B	CAP,E 10UF-50V	
C561	ECA2EHG470E	CAP,E 47UF-250V	
C562	ECKR3A561KBP	CAP,C 560PF-K-1KV	
C563	EEUEB2E330E	CAP,E 33UF-100V	
C564	ECA1VM470B	CAP,E 47UF-35V	
C566	ECA1VM470B	CAP,E 47UF-35V	
C567	EEUED2C101E	CAP,E 100UF-100V	
C568	ECWF4683RJB	CAP,P .068UF-R-400V	
C569	ECWF4683RJB	CAP,P .068UF-R-400V	
C571	ECKRHT332KB	CAP,C 3300PF-K	
C573	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	
C574	ECA1CM100B	CAP,E 10UF-16V	
C575	ECA1CM101B	CAP,E 100UF-16V	
C576	ECA1CM101B	CAP,E 100UF-16V	
C576	ECKR3A331KBP	CAP,C 330PF-K-1KVDC	
C577	ECQE6473RKF	CAP,P .047UF-630V	
C578	ECKW3D681KBR	CAP,C 680PF-K-2KV	
C580	ECQB1H223JF3	CAP,P .022UF-J-50V	
C581	ECQB1H104JF3	CAP,P .10UF-J-50V	
C582	ECQB1H104JF3	CAP,P .10UF-J-50V	
C589	ECQE6184JFB	CAP,P .18UF-J-630V	
C590	ECJ2VB1H471K	CAP,C 470PF-K-50V	
C713	ECKR3A222KBP	CAP,C .0022UF-K-1KV	
C714	ECQE2103KF3	CAP,P .010UF-K-200V	
C801	ECQU2A224MLA	CAP,P .22UF-M-250V	⚠
C802	ECQU2A224MLA	CAP,P .22UF-M-250V	⚠
C803	ECQU2A224MLA	CAP,P .22UF-M-250V	⚠
C804	ECQU2A224MLA	CAP,P .22UF-M-250V	⚠
C805	ECQB1H103JF3	CAP,P .01UF-J-50V	
C806	ECQU2A103MLA	CAP,P .010UF-M-250V	⚠
C807	ECKCNA222MEB	CAP,C 2200PF-M-125V	⚠

C808	ECKCNA222MEB	CAP,C 2200PF-M-125V	⚠
C809	ECQB1H104JF3	CAP,P .10UF-J-50V	
C809	ECQB1H471JF3	CAP,P 470PF-J-50V	
C810	EETHC2D102J	CAP,E 1000UF-200V	
C811	ECA1HM100B	CAP,E 10UF-50V	
C812	ECA1CM471B	CAP,E 470UF-16V	
C813	ECA1HM010B	CAP,E 1UF-50V	
C815	ECA1EM471B	CAP,E 470UF-25V	
C821	ECKW3D332KBP	CAP,C 3300PF-K-2KV	
C822	ECQB1H102JF3	CAP,P 1000PF-J-50V	
C823	ECQB1H471JF3	CAP,P 470PF-J-50V	
C824	ECKW3D102KBP	CAP,C 1000PF-K-2KV	
C825	ECA1HHG470B	CAP,E 47UF-50V	
C826	ECJ2VF1H104Z	CAP,C .1UF-Z-50V	
C827	ECA1HHG010B	CAP,E 1UF-50V	
C828	ECKR3A331KBP	CAP,C 330PF-K-1KVDC	
C830	EC0S2DA471BB	CAP,E 470UF-200V	
C831	ECKW3D102KBP	CAP,C 1000PF-K-2KV	
C834	EEUFC1H222E	CAP,E 2200UF-50V	
C835	ECA2EM101E	CAP,E 100UF-250V	
C836	ECKR3A151KBP	CAP,C 150PF-K-1KV	
C840	EEUFC1E222E	CAP,E 2200UF-25V	
C841	ECA1VHG222E	CAP,E 2200UF-35V	
C842	ECKR3A331KBP	CAP,C 330PF-K-1KVDC	
C843	ECA1VHG222E	CAP,E 2200UF-35V	
C843	EEUFC1E222E	CAP,E 2200UF-25V	
C844	ECKR3A471KBP	CAP,C 470PF-K-1KV	
C846	ECEA1CN101UB	CAP,E 100UF-16V	
C851	ECKR3A151KBP	CAP,C 150PF-K-1KV	
C852	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	
C854	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	
C855	ECA1CM101B	CAP,E 100UF-16V	
C855	EEUFC1A471B	CAP,E 470UF-10V	
C857	ECA1CM471B	CAP,E 470UF-16V	
C857	ECA1HM471E	CAP,E 470UF-50V	
C858	ECA1CM101B	CAP,E 100UF-16V	
C864	ECEA1CN101UB	CAP,E 100UF-16V	
C867	ECQM4103RJZ	CAP,P .01UF-J-400V	

C871	ECA1CM102B	CAP,E 1000UF-16V	
C875	ECA1HM010B	CAP,E 1UF-50V	
C875	ECQB1H473JF3	CAP,P .047UF-J-50V	
C876	ECKR3A331KBP	CAP,C 330PF-K-1KVDC	
C881	ECKR3A471KBP	CAP,C 470PF-K-1KV	
C882	ECA1VHG222E	CAP,E 2200UF-35V	
C900	ECJ2VF1C104Z	CAP,C .1UF-Z-16V	
C901	ECJ2VC1H102K	CAP,C .001UF-K-50V	
C903	ECJ2VF1C104Z	CAP,C .1UF-Z-16V	
C905	ECA1CM221B	CAP,E 10UF-16V	
C906	ECJ2VF1C104Z	CAP,C .1UF-Z-16V	
C910	ECQB1223KF3	CAP,P .22UF-K-100V	
C911	ECQM4103KZ3	CAP,P .01UF-K-400V	
C912	ECA2CM330E	CAP,E 30UF-160V	
C914	ECQB1223KF3	CAP,P .22UF-K-100V	
C915	ECA2CHG330E	CAP,E 33UF-160V	
C916	ECA1CM101B	CAP,E 100UF-16V	
C917	ECA1CM101B	CAP,E 100UF-16V	
C918	ECA1CM221B	CAP,E 10UF-16V	
C919	ECJ2VC1H102K	CAP,C .001UF-K-50V	
C920	ECJ2VC1H102K	CAP,C .001UF-K-50V	
C927	ECJ2VF1C104Z	CAP,C .1UF-Z-16V	
C1051	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	
C1052	ECEA1CKA470B	CAP,E 47UF-16V	
C1401	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	
C1402	ECJ2VF1C104Z	CAP,C .1UF-Z-16V	
C1403	ECA1VM470B	CAP,E 47UF-35V	
C1501	ECA1VM470B	CAP,E 47UF-35V	
C1502	ECQB1H103JF3	CAP,P .01UF-J-50V	
C1505	ECQB1H103JF3	CAP,P .01UF-J-50V	
C1506	ECQB1H223JF3	CAP,P .022UF-J-50V	
C1507	ECQB1H223JF3	CAP,P .022UF-J-50V	
C1522	ECA1VM101B	CAP,E 100UF-35V	
C1523	ECA1VM470B	CAP,E 47UF-35V	
C1526	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	
C1528	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	
C1535	ECA1HM100B	CAP,E 10UF-50V	
C1557	ECQB1H102JF3	CAP,P 1000PF-J-50V	
C1558	ECJ2VC1H680J	CAP,C 68PF-J-50V	

C1559	ECQB1H102JF3	CAP,P 1000PF-J-50V	
C1570	ECA1VM470B	CAP,E 47UF-35V	
C2202	ECEA1HKA2R2B	CAP,E 2.2UF-50V	
C2203	ECEA1HKA4R7B	CAP,E 4.7UF-50V	
C2204	AP106K016CAE	CAP,T 1OUF-16V	
C2205	ECEA1HKA010B	CAP,E 1.0UF-50V	
C2206	ECQB1H223JF3	CAP,P .022UF-J-50V	
C2207	AP335K016CAE	CAP,T 3.3UF-16V	
C2208	ECJ2VB1C104K	CAP,C .1UF-K-16V	
C2209	ECJ2VB1C104K	CAP,C .1UF-K-16V	
C2210	ECJ2VB1C104K	CAP,C .1UF-K-16V	
C2211	ECEA1HKA100B	CAP,E 1UF-50V	
C2212	ECQB1H473JF3	CAP,P .047UF-J-50V	
C2215	ECEA1CKA101B	CAP,E 100UF-16V	
C2218	ECEA1HKAR47B	CAP,E .47UF-50V	
C2301	ECEA1HN100UB	CAP,E 10UF-50V	
C2302	ECJ2VB1H332K	CAP,C .0033UF-K-50V	
C2303	ECJ2VB1H332K	CAP,C .0033UF-K-50V	
C2304	ECJ2VB1H332K	CAP,C .0033UF-K-50V	
C2305	ECEA1HN100UB	CAP,E 10UF-50V	
C2306	ECJ2VB1H332K	CAP,C .0033UF-K-50V	
C2307	ECJ2VB1H332K	CAP,C .0033UF-K-50V	
C2308	ECJ2VB1H332K	CAP,C .0033UF-K-50V	
C2310	ECJ2VF1H104Z	CAP,C .1UF-Z-50V	
C2311	ECA1EM221B	CAP,E 220UF-25V	
C2313	ECA1HM4R7B	CAP,E 4.7UF-50V	
C2315	ECA1HM4R7B	CAP,E 4.7UF-50V	
C2318	ECA1HM2R2B	CAP,E 2.2UF-50V	
C2320	F1J1C225A083	CAP,C 2.2UF-Z-16V	
C2321	ECJ2VB1H333K	CAP,C .033UF-K-50V	
C2322	ECEA1CN100UB	CAP,E 10UF-16V	
C2323	ECJ2VB1H561K	CAP,C 560PF-K-50V	
C2324	ECJ2VB1H471K	CAP,C 470PF-K-50V	
C2325	ECJ2VC1H270J	CAP,C 27PF-J-50V	
C2326	ECJ2VF1H104Z	CAP,C .1UF-Z-50V	
C2327	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	
C2328	ECA1EM101B	CAP,E 100UF-25V	
C2329	ECJ2VB1H471K	CAP,C 470PF-K-50V	
C2330	ECJ2VB1H331K	CAP,C 330PF-K-50V	

C2331	ECJ2FB1H104K	CAP,C .1UF-K-50V	
C2332	ECJ2VB1H682K	CAP,C .0068UF-K-50V	
C2333	ECJ2VB1H331K	CAP,C 330PF-K-50V	
C2334	ECJ2FB1H104K	CAP,C .1UF-K-50V	
C2335	ECJ2VB1H471K	CAP,C 470PF-K-50V	
C2336	ECJ2VB1H471K	CAP,C 470PF-K-50V	
C2337	ECJ2VB1H682K	CAP,C .0068UF-K-50V	
C2338	ECJ2FB1H104K	CAP,C .1UF-K-50V	
C2341	ECEA1CN100UB	CAP,E 10UF-16V	
C2342	ECJ2VB1H333K	CAP,C .033UF-K-50V	
C2345	EEUFC1E222E	CAP,E 2200UF-25V	
C2346	ECJ2VB1H561K	CAP,C 560PF-K-50V	
C2351	ECJ2VB1H561K	CAP,C 560PF-K-50V	
C2352	ECJ2VB1H561K	CAP,C 560PF-K-50V	
C2352	EEUFC1E222E	CAP,E 2200UF-25V	
C2353	EEUFC1E222E	CAP,E 2200UF-25V	
C2354	ECJ2VB1H561K	CAP,C 560PF-K-50V	
C2355	ECJ2VB1H561K	CAP,C 560PF-K-50V	
C2357	ECJ2VF1H104Z	CAP,C .1UF-Z-50V	
C2359	ECQV1H224JL3	CAP,P .22UF-J-50V	
C2362	ECQV1H224JL3	CAP,P .22UF-J-50V	
C2364	ECJ2FB1H104K	CAP,C .1UF-K-50V	
C2365	ECJ2FB1H104K	CAP,C .1UF-K-50V	
C2365	ECJ2VF1H104Z	CAP,C .1UF-Z-50V	
C2366	EEUFC1E222E	CAP,E 2200UF-25V	
C2370	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	
C2371	ECEA1CN100UB	CAP,E 10UF-16V	
C2372	ECEA1CN100UB	CAP,E 10UF-16V	
C2373	ECA1HM100B	CAP,E 10UF-50V	
C2374	ECA1HM100B	CAP,E 10UF-50V	
C2375	ECJ2VF1C105Z	CAP,C 1.0UF-Z-16V	
C2376	ECJ2VF1C105Z	CAP,C 1.0UF-Z-16V	
C2377	ECJ2VF1C105Z	CAP,C 1.0UF-Z-16V	
C2378	ECJ2VF1C105Z	CAP,C 1.0UF-Z-16V	
C2404	ECJ2VB1H223K	CAP,C .022UF-K-50V	
C2406	ECJ2FB1H104K	CAP,C .1UF-K-50V	
C2408	ECEA1CN100UB	CAP,E 10UF-16V	
C2410	ECA1HM100B	CAP,E 10UF-50V	
C2414	ECJ2VB1H223K	CAP,C .022UF-K-50V	

C2416	ECJ2FB1H104K	CAP,C .1UF-K-50V	
C2418	ECEA1CN100UB	CAP,E 10UF-16V	
C2451	ECJ2VF1C105Z	CAP,C 1.0UF-Z-16V	
C2452	ECJ2VB1H472K	CAP,C .0047UF-K-50V	
C2453	ECJ2VB1H223K	CAP,C .022UF-K-50V	
C2454	ECJ2VB1H332K	CAP,C .0033UF-K-50V	
C2455	ECJ2FB1C684K	CAP,C .68UF-Z-16C	
C2456	ECJ2VF1C105Z	CAP,C 1.0UF-Z-16V	
C2457	ECJ2VB1C104K	CAP,C .1UF-K-16V	
C2458	ECJ2VF1C105Z	CAP,C 1.0UF-Z-16V	
C2459	ECJ2VF1C105Z	CAP,C 1.0UF-Z-16V	
C2460	ECJ2VB1H103K	CAP,C .01UF-K-50V	
C2461	ECA1CM221B	CAP,E 10UF-16V	
C2462	ECJ2VF1C105Z	CAP,C 1.0UF-Z-16V	
C2463	ECJ2VF1C105Z	CAP,C 1.0UF-Z-16V	
C2464	ECJ2VF1C105Z	CAP,C 1.0UF-Z-16V	
C2465	ECJ2VB1C104K	CAP,C .1UF-K-16V	
C2466	ECJ2FB1C684K	CAP,C .68UF-Z-16C	
C2467	ECJ2VB1H332K	CAP,C .0033UF-K-50V	
C2468	ECJ2VB1H223K	CAP,C .022UF-K-50V	
C2469	ECJ2VB1H472K	CAP,C .0047UF-K-50V	
C2470	ECJ2VF1C105Z	CAP,C 1.0UF-Z-16V	
C2851	ECA1EM471B	CAP,E 470UF-25V	
C2852	ECA1CM221B	CAP,E 10UF-16V	
C2855	ECA1EM471B	CAP,E 470UF-25V	
C2855	ECA1VM221B	CAP,E 220UF-35V	
C2857	EEUFC1C471B	CAP,E 470UF-16V	
C2859	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	
C2861	ECA1CM471B	CAP,E 470UF-16V	
C2861	EEUFC1A471B	CAP,E 470UF-10V	
C2862	ECA1HM471E	CAP,E 470UF-50V	
C2862	ECA1VM471B	CAP,E 470UF-35V	
C2865	ECA1CM221B	CAP,E 10UF-16V	
C2865	ECA1EM221B	CAP,E 220UF-25V	
C2867	EEUFC1A471B	CAP,E 470UF-10V	
C2869	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	
C2870	ECA1CM221B	CAP,E 10UF-16V	
C2870	ECA1EM221B	CAP,E 220UF-25V	
C2872	EEUFC1A471B	CAP,E 470UF-10V	

C2874	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	
C2875	ECA1CM471B	CAP,E 470UF-16V	
C2877	EEUFC1A102B	CAP,E 1000UF-10V	
C2877	EEUFC1A471B	CAP,E 470UF-10V	
C2879	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	
C2881	ECJ2VB1H103K	CAP,C .01UF-K-50V	
C2882	ECJ2VB1H103K	CAP,C .01UF-K-50V	
C2884	ECA0JM222B	CAP,E 2200UF-6.3V	
C2891	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	
C2892	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	
C3331	ECJ2VB1H152K	CAP,C .0015UF-K-50V	
C3332	ECJ2VF1C105Z	CAP,C 1.0UF-Z-16V	
C3333	ECJ2VB1H152K	CAP,C .0015UF-K-50V	
C3334	ECJ2VF1C105Z	CAP,C 1.0UF-Z-16V	
C3335	ECJ2VB1H152K	CAP,C .0015UF-K-50V	
C3336	ECJ2VF1C105Z	CAP,C 1.0UF-Z-16V	
C3337	ECJ2VB1H152K	CAP,C .0015UF-K-50V	
C3338	ECJ2VF1C105Z	CAP,C 1.0UF-Z-16V	
C3339	ECJ2VB1H103K	CAP,C .01UF-K-50V	
C3340	ECJ2YB1A105K	CAP,C 1.0UF-K-125V	
C3341	ECJ2YB1A105K	CAP,C 1.0UF-K-125V	
C3342	ECJ2VF1C105Z	CAP,C 1.0UF-Z-16V	
C3343	ECJ2VB1H152K	CAP,C .0015UF-K-50V	
C3344	ECJ2VF1C105Z	CAP,C 1.0UF-Z-16V	
C3345	ECJ2VB1H152K	CAP,C .0015UF-K-50V	
C3346	ECJ2VB1H103K	CAP,C .01UF-K-50V	
C3347	ECJ2YB1A105K	CAP,C 1.0UF-K-125V	
C3348	ECJ2YB1A105K	CAP,C 1.0UF-K-125V	
C3349	ECJ2VB1H152K	CAP,C .0015UF-K-50V	
C3350	ECJ2VF1C105Z	CAP,C 1.0UF-Z-16V	
C3351	ECJ2VB1H152K	CAP,C .0015UF-K-50V	
C3352	ECJ2VF1C105Z	CAP,C 1.0UF-Z-16V	
C3353	ECJ2YB1A105K	CAP,C 1.0UF-K-125V	
C3354	ECJ2VB1H152K	CAP,C .0015UF-K-50V	
C3355	ECJ2VF1C105Z	CAP,C 1.0UF-Z-16V	
C3357	ECJ2VB1H152K	CAP,C .0015UF-K-50V	
C3358	ECJ2VF1C105Z	CAP,C 1.0UF-Z-16V	
C3359	ECA1EM471E	CAP,E 470UF-25V	
C3360	ECJ2VB1H152K	CAP,C .0015UF-K-50V	

C3361	ECJ2VB1H152K	CAP,C .0015UF-K-50V	
C3362	ECJ2VF1C105Z	CAP,C 1.0UF-Z-16V	
C3363	ECJ2VF1C105Z	CAP,C 1.0UF-Z-16V	
C3364	ECJ2YB1A105K	CAP,C 1.0UF-K-125V	
C3365	ECJ2YB1A105K	CAP,C 1.0UF-K-125V	
C3366	ECJ2YB1A105K	CAP,C 1.0UF-K-125V	
C3367	ECJ2YB1A105K	CAP,C 1.0UF-K-125V	
C3368	ECJ2YB1A105K	CAP,C 1.0UF-K-125V	
C3369	ECJ2YB1A105K	CAP,C 1.0UF-K-125V	
C3401	ECJ2VB1H152K	CAP,C .0015UF-K-50V	
C3402	ECJ2VB1H152K	CAP,C .0015UF-K-50V	
C3405	ECA1HM010B	CAP,E 1UF-50V	
C3406	ECA1HM010B	CAP,E 1UF-50V	
C3801	ECA1CM101B	CAP,E 100UF-16V	
C3802	ECA1VM470B	CAP,E 47UF-35V	
C3803	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	
C3804	ECQE2104KF3	CAP,P .10UF-K-200V	
C3805	ECA2DM330B	CAP,E 33UF-200V	
C3806	ECQE2474KF3	CAP,P .47UF-K-200V	
C3807	ECQE2474KF3	CAP,P .47UF-K-200V	
C3808	ECKC3D332KBN	CAP,C 3300PF-K-2KV	
C3809	ECQE2474KF3	CAP,P .47UF-K-200V	
C3811	ECQE2103KF3	CAP,P .010UF-K-200V	
C3812	ECQE2104KF3	CAP,P .10UF-K-200V	
C3813	ECQE2104KF3	CAP,P .10UF-K-200V	
C3814	ECQE2104KF3	CAP,P .10UF-K-200V	
C3815	ECQE2103KF3	CAP,P .010UF-K-200V	
C3816	ECQE2103KF3	CAP,P .010UF-K-200V	
C3817	ECQE2103KF3	CAP,P .010UF-K-200V	
C3825	ECA2EM010B	CAP,E 1UF-250V	
C3826	ECA1VM470B	CAP,E 47UF-35V	
C3827	ECJ2VB1H103K	CAP,C .01UF-K-50V	
C3828	ECJ2VB1H103K	CAP,C .01UF-K-50V	
C3829	ECKR2H102KB5	CAP,C 1000PF-K-500V	
C3830	ECA2EM470E	CAP,E 47UF-250V	
C456A	ECJ2VB1H472K	CAP,C .0047UF-K-50V	
C468A	ECJ2VB1H272K	CAP,C .0027UF-K-50V	
C469A	ECJ2FB1H104K	CAP,C .1UF-K-50V	
C502A	ECJ2VF1H104Z	CAP,C .1UF-Z-50V	

C503A	ECJ2VB1H102K	CAP,C .001UF-K-50V	
C5501	ECEA1CN220UB	CAP,E 22UF-16V	
C5506	ECJ2VB1C104K	CAP,C .1UF-K-16V	
C5507	ECEA1CN220UB	CAP,E 22UF-16V	
C5801	ECA1CM101B	CAP,E 100UF-16V	
C5803	ECA1CM101B	CAP,E 100UF-16V	
C5804	ECJ2VB1C104K	CAP,C .1UF-K-16V	
C5805	ECA1VM470B	CAP,E 47UF-35V	
C5807	ECQB1H104JF3	CAP,P .10UF-J-50V	
C5808	ECA1VM470B	CAP,E 47UF-35V	
DIODES			
D005	MA3X152K0L	DIODE	
D009	MA2C165001VT	DIODE	
D012	MAZ40360MF	DIODE, ZENER	
D460	MA2C165001VT	DIODE	
D461	MA2C165001VT	DIODE	
D462	MAZ40300MF	DIODE, ZENER	
D463	MA2C165001VT	DIODE	
D465	MAZ40390MF	DIODE, ZENER	
D466	MA2C165001VT	DIODE	
D468	MA2C165001VT	DIODE	
D469	MAZ40300MF	DIODE, ZENER	
D470	MA2C165001VT	DIODE	
D471	MA2C700A0F	DIODE	
D501	MAZ41500MF	DIODE, ZENER	
D502	MAZ41500MF	DIODE, ZENER	
D503	B0HALP000002	DIODE, FAST RECOVERY	
D506	B0JAME000058	DIODE, SCHOTTKY BARRIER	
D507	B0JAME000058	DIODE, SCHOTTKY BARRIER	
D508	B0HAGV000004	DIODE, FAST RECOVERY	
D509	MA2C165001VT	DIODE	
D510	MAZ40820MF	DIODE, ZENER	⚠
D511	B0EALV000001	DIODE, RECTIFIER	
D513	MAZ42700MF	DIODE, ZENER	
D516	MAZ40390MF	DIODE, ZENER	
D517	B0HALP000002	DIODE, FAST RECOVERY	
D518	MA2C165001VT	DIODE	
D519	B0HALP000002	DIODE, FAST RECOVERY	

D521	MAZ41800MF	DIODE, ZENER	
D522	B0AAGR000002	DIODE, SWITCHING	
D523	FMRG5HSLF731	DIODE	
D524	MA2C165001VT	DIODE	
D525	B0HALP000002	DIODE, FAST RECOVERY	
D528	B0HALP000002	DIODE, FAST RECOVERY	
D532	MA2C165001VT	DIODE	
D533	MA2C700A0F	DIODE	
D534	MA2C165001VT	DIODE	
D539	MA2C165001VT	DIODE	
D540	B0HALP000002	DIODE, FAST RECOVERY	
D541	B0JAME000058	DIODE, SCHOTTKY BARRIER	
D542	B0HACW000002	DIODE, FAST RECOVERY	
D542	B0JAME000058	DIODE, SCHOTTKY BARRIER	
D543	MA2C165001VT	DIODE	
D544	B0AAGR000002	DIODE, SWITCHING	
D545	B0AAGR000002	DIODE, SWITCHING	
D549	MA2C165001VT	DIODE	
D556	B0HAHM000008	DIODE, FAST RECOVERY	
D584	MA2C165001VT	DIODE	
D701	MA2C029TAF	DIODE	
D702	MA2C029TAF	DIODE	
D801	B0FBAT000005	DIODE, RECTIFIER	⚠
D803	D4DDF1R50001	DIODE	⚠
D804	B0EAKL000008	DIODE, RECTIFIER	
D805	B0EAKL000008	DIODE, RECTIFIER	
D807	MA2C165001VT	DIODE	
D809	ERZV10D391	VARISTOR, SURGE ABSORBER	⚠
D811	B0EAKL000008	DIODE, RECTIFIER	
D814	MA2C165001VT	DIODE	
D815	MA2C165001VT	DIODE	
D816	MA2C165001VT	DIODE	
D817	MAZ42200LF	DIODE, ZENER	
D819	MA2C165001VT	DIODE	
D820	AU01ZV0	DIODE	
D821	AU01ZV0	DIODE	
D822	B0HAMM000036	DIODE, FAST RECOVERY	
D823	MAZ406800F	DIODE, ZENER	

D824	B0BA01000046	DIODE, VOLTAGE REGULATION	
D825	B0HANR000003	DIODE, FAST RECOVERY	
D827	B0HANM000016	DIODE, FAST RECOVERY	
D828	MA3D690	DIODE	
D829	S2L20UF04P12	DIODE	
D830	MA3D690	DIODE	
D831	MAZ41300MF	DIODE, ZENER	
D832	MAZ41100HF	DIODE, ZENER	
D832	MAZ41500MF	DIODE, ZENER	
D833	MA2C165001VT	DIODE	
D834	MAZ40360MF	DIODE, ZENER	
D835	MA2C165001VT	DIODE	
D836	MAZ41600MF	DIODE, ZENER	
D837	B0HAGV000004	DIODE, FAST RECOVERY	
D844	MA2C165001VT	DIODE	
D845	MAZ41500MF	DIODE, ZENER	
D850	MA2C165001VT	DIODE	
D857	MA2C165001VT	DIODE	
D859	MA2C165001VT	DIODE	
D861	AU02ZV0	DIODE	
D862	MA2C165001VT	DIODE	
D863	MAZ43300MF	DIODE, ZENER	
D866	B0EAKT000018	DIODE, RECTIFIER	
D867	MA2C165001VT	DIODE	
D870	B0HANM000016	DIODE, FAST RECOVERY	
D875	MA3D690	DIODE	
D876	B0JCME000025	DIODE, SCHOTTKY BARRIER	
D1001	LN81RPH	DIODE	
D1051	MA2C165001VT	DIODE	
D1052	MA2C165001VT	DIODE	
D1401	MA3X152E0L	DIODE	
D1503	MA3X152K0L	DIODE	
D1550	MA2C700A0F	DIODE	
D1555	B0EAKL000008	DIODE, RECTIFIER	
D1560	MAZ40360MF	DIODE, ZENER	
D2301	MAZ42700MF	DIODE, ZENER	
D2302	MA3X152K0L	DIODE	
D2303	MA2C16700E	DIODE	
D2305	MA3X152K0L	DIODE	

D2307	MA2C16700E	DIODE	
D2308	MAZ42700MF	DIODE, ZENER	
D2325	MA3X152K0L	DIODE	
D2351	MA2C16700E	DIODE	
D2852	B0JCME000025	DIODE, SCHOTTKY BARRIER	
D2856	B0JCME000025	DIODE, SCHOTTKY BARRIER	
D2858	B0JCME000025	DIODE, SCHOTTKY BARRIER	
D2860	B0JCME000025	DIODE, SCHOTTKY BARRIER	
D2861	B0JAME000058	DIODE, SCHOTTKY BARRIER	
D2862	B0JCME000025	DIODE, SCHOTTKY BARRIER	
D2881	MA2C165001VT	DIODE	
D2882	MA2C165001VT	DIODE	
D2883	MA2C165001VT	DIODE	
D2884	MA2C165001VT	DIODE	
D3301	MAZ31100ML	DIODE, ZENER	
D3302	MAZ31100ML	DIODE, ZENER	
D3304	MAZ31100ML	DIODE, ZENER	
D3306	MAZ31100ML	DIODE, ZENER	
D3307	MAZ31100ML	DIODE, ZENER	
D3308	MAZ31100ML	DIODE, ZENER	
D3309	MAZ31100ML	DIODE, ZENER	
D3310	MAZ31100ML	DIODE, ZENER	
D3312	MAZ31100ML	DIODE, ZENER	
D3314	MAZ31100ML	DIODE, ZENER	
D3316	MAZ31100ML	DIODE, ZENER	
D3317	MAZ31100ML	DIODE, ZENER	
D3318	MAZ31100ML	DIODE, ZENER	
D3319	MAZ31100ML	DIODE, ZENER	
D3320	MAZ31100ML	DIODE, ZENER	
D3321	MAZ31100ML	DIODE, ZENER	
D3322	MAZ31100ML	DIODE, ZENER	
D3323	MAZ31100ML	DIODE, ZENER	
D3324	MAZ31100ML	DIODE, ZENER	
D3325	MAZ31100ML	DIODE, ZENER	
D3326	MAZ31100ML	DIODE, ZENER	
D3328	MAZ31100ML	DIODE, ZENER	
D3329	MAZ31100ML	DIODE, ZENER	
D3330	MAZ31100ML	DIODE, ZENER	
D3332	CVS20A120MTA	DIODE	

D3334	CVS20A120MTA	DIODE	
D3335	MAZ31100ML	DIODE, ZENER	
D3336	MAZ31100ML	DIODE, ZENER	
D3403	MAZ31100ML	DIODE, ZENER	
D3404	MAZ31100ML	DIODE, ZENER	
D3405	MAZ31100ML	DIODE, ZENER	
D3406	MAZ31100ML	DIODE, ZENER	
D3407	MAZ31100ML	DIODE, ZENER	
D3408	MAZ31100ML	DIODE, ZENER	
D3409	MAZ31100ML	DIODE, ZENER	
D3410	MAZ31100ML	DIODE, ZENER	
D3801	MAZ40620L3TV	DIODE, ZENER	
D3805	MA2C18800E	DIODE	
D3807	MA2C18800E	DIODE	
D3812	MAZ41300MF	DIODE, ZENER	
D3813	B0HAGP000003	DIODE, FAST RECOVERY	
D3816	MA2C18800E	DIODE	
D3817	MA2C18800E	DIODE	
D3819	MA2C0290AF	DIODE	
D3820	MA2C0290AF	DIODE	
D3821	MA2C0290AF	DIODE	
D3823	B0HALP000002	DIODE, FAST RECOVERY	
D3824	B0HAGP000003	DIODE, FAST RECOVERY	
D3831	B0HALP000002	DIODE, FAST RECOVERY	
D3833	B0HALP000002	DIODE, FAST RECOVERY	
D3834	MA2C18800E	DIODE	
D3835	MA2C18800E	DIODE	
D3836	MA2C18800E	DIODE	
D3837	MA2C18800E	DIODE	
D3838	MA2C18800E	DIODE	
D3839	MA2C18800E	DIODE	
D3844	ERZV07D361	VARISTOR, SURGE ABSORBER	
D3850	MA2C18800E	DIODE	
FUSES			
F801	XBA2A00101	FUSE 6.3A 125V	⚠
INTEGRATED CIRCUITS			
IC002	TVR2AJ202S	EEPROM	
IC006	C1AB00000441	INT. CKT.	

IC451	C1AA00000665	INT CKT	
IC500	C0AABB000107	IC (OPERATIONAL AMPLIFIER)	
IC501	AN1431T-TA	INT CKT	
IC502	AN5751N	INT CKT	
IC503	0N3171R	INT CKT	
IC504	0N3171R	INT CKT	
IC507	AN6914	INT CKT	
IC801	C5HABZZ00126	INT CKT	
IC802	C0EAS0000024	IC (VOLTAGE DETECTING)	
IC804	B0EBKM000016	DIODE, RECTIFIER	
IC805	C0DAAZG00011	IC (FOR POWER SUPPLY)	
IC811	0N3171R	INT CKT	⚠
IC1401	C0BBBA000043	IC (COMPARATOR)	
IC1501	C0BBBA000043	IC (COMPARATOR)	
IC1502	C0ABBA000073	IC (OPERATIONAL AMPLIFIER)	
IC1503	C0BBBA000043	IC (COMPARATOR)	
IC2201	AN5849S-E1V	INT CKT	
IC2301	C1AA00000645	INT CKT	
IC2303	C0BBBA000043	IC (COMPARATOR)	
IC2305	C0ABBA000073	IC (OPERATIONAL AMPLIFIER)	
IC2451	NJW1164MPTE1	INT. CKT.	
IC2851	C0CACKG00003	IC (VOLTAGE REGULATOR)	
IC2852	C0DAAZG00011	IC (FOR POWER SUPPLY)	
IC2854	C0DAAZG00011	IC (FOR POWER SUPPLY)	
IC2855	C0DAAZG00011	IC (FOR POWER SUPPLY)	
IC2856	C0DAAZG00011	IC (FOR POWER SUPPLY)	
IC2857	C0DAAZG00011	IC (FOR POWER SUPPLY)	
IC3801	C1AA00000662	INT CKT	
IC5801	AN15530B	INT CKT	
IC5802	C0AABB000107	IC (OPERATIONAL AMPLIFIER)	
COILS			
L002	ELESN330JA	COIL, PEAKING 33UH	
L009	ELELN330KA	COIL, PEAKING 33UH	
L011	ELELN330KA	COIL, PEAKING 33UH	
L452	EXCELDR35V	FERRITE BEAD	
L453	ELC18B152L	COIL, CHOKE	
L454	EXCELSA35T	FERRITE BEAD	
L501	EXCELSA24T	FERRITE BEAD	

L502	EXCELSA24T	FERRITE BEAD	
L503	ELC12D103E	COIL, CHOKE	
L504	EXCELSA26T	FERRITE BEAD	
L505	EXCELSA26T	FERRITE BEAD	
L506	EXCELSA24T	FERRITE BEAD	
L509	ELC09D100F	COIL, CHOKE 10UH	
L510	ELC12D103E	COIL, CHOKE	
L514	EXCELSA35T	FERRITE BEAD	
L515	ELC09D471F	COIL, CHOKE 470UH	
L516	ELC09D101DF	COIL, CHOKE 100UH	
L516	ELC09D101F	COIL, CHOKE 100UH	
L553	EXCELSA35T	FERRITE BEAD	
L554	ELH5L8115	COIL, LINEARITY	
L561	ELC16B182L	COIL, CHOKE	
L812	EXCELSA39V	FERRITE BEAD	
L813	EXCELSA39V	FERRITE BEAD	
L816	EXCELSA39E	FERRITE BEAD	
L817	EXCELSA24T	FERRITE BEAD	
L818	EXCELSA24T	FERRITE BEAD	
L819	EXCELDR35V	FERRITE BEAD	
L821	EXCELSA39E	FERRITE BEAD	
L823	TLUADTB820K	COIL	
L824	EXCELDR35V	FERRITE BEAD	
L825	ELC09D470DF	COIL, CHOKE 47UH	
L826	ELC09D101DF	COIL, CHOKE 100UH	
L827	ELC09D101DF	COIL, CHOKE 100UH	
L829	EXCELDR25V	FERRITE BEAD	
L830	EXCELDR35V	FERRITE BEAD	
L831	EXCELDR35V	FERRITE BEAD	
L836	EXCELDR35V	FERRITE BEAD	
L845	G0A101ZA0041	COIL, LINE CHOKE	
L846	ELC09D220DF	COIL, CHOKE 22UH	
L901	TALV35VB100J	COIL	
L903	EXCELSA35T	FERRITE BEAD	
L904	EXCELSA35T	FERRITE BEAD	
L906	TALV35VB330J	COIL	
L2201	ELESN100JA	COIL, PEAKING 10UH	
L2304	ELC12E390	COIL, CHOKE 39UH	
L2305	ELC12E390	COIL, CHOKE 39UH	

L2306	EXCELDR35V	FERRITE BEAD	
L2307	EXCELDR35V	FERRITE BEAD	
L2341	G0A330G00010	COIL, LINE CHOKE	
L2342	G0A330G00010	COIL, LINE CHOKE	
L2854	G0A101ZA0041	COIL, LINE CHOKE	
L2855	G0A220GA0002	COIL, LINE CHOKE	
L2860	G0A470ZA0041	COIL, LINE CHOKE	
L2863	G0A470ZA0041	COIL, LINE CHOKE	
L2866	G0A470ZA0041	COIL, LINE CHOKE	
L2868	G0A470ZA0041	COIL, LINE CHOKE	
L2869	G0A470ZA0041	COIL, LINE CHOKE	
L3303	G0BYYYY00016	TRANSFORMER	
L3304	G0BYYYY00016	TRANSFORMER	
L3401	G0BYYYY00016	TRANSFORMER	
L3403	EXCELSA35T	FERRITE BEAD	
L3801	TALV35VB2R2J	COIL	
L3802	TALV35VB2R2J	COIL	
L3803	TALV35VB2R2J	COIL	
L3804	EXCELSA24T	FERRITE BEAD	
L3806	EXCELDR35V	FERRITE BEAD	
L3807	EXCELDR35V	FERRITE BEAD	
L3812	EXCELDR35V	FERRITE BEAD	
L3813	EXCELDR35V	FERRITE BEAD	
L3825	EXCELSA24T	FERRITE BEAD	
L3826	EXCELSA35T	FERRITE BEAD	
L3830	EXCELSA24T	FERRITE BEAD	
L552A	ELH5L7740	COIL, LINEARITY	
LF801	G0B650H00002	COIL	⚠
LF802	G0B650H00002	COIL	⚠
LF803	G0B650H00002	COIL	⚠
TRANSISTORS			
Q002	UNR221100L	TRANSISTOR	
Q003	UNR211500L	TRANSISTOR	
Q013	2PD601AR-115	TRANSISTOR	
Q404	2PD601AR-115	TRANSISTOR	
Q405	2PD601AR-115	TRANSISTOR	
Q406	2PD601AR-115	TRANSISTOR	
Q459	2SC1473AR	TRANSISTOR	

Q501	B1CEML000001	TRANSISTOR	
Q511	2PB709AR-115	TRANSISTOR	
Q512	2PD601AR-115	TRANSISTOR	
Q513	2PD601AR-115	TRANSISTOR	
Q514	2PD601AR-115	TRANSISTOR	
Q515	2PB709AR-115	TRANSISTOR	
Q516	2PD601AR-115	TRANSISTOR	
Q517	2PB709AR-115	TRANSISTOR	
Q551	2SC5686000LK	TRANSISTOR	
Q556	B1DAFU000002	TRANSISTOR	
Q560	B1DGDN000001	TRANSISTOR	
Q561	B1DEDQ000009	TRANSISTOR	
Q562	2SK2538000LB	TRANSISTOR	
Q563	B1BAAT000001	TRANSISTOR	
Q564	2SC1685QRSTA	TRANSISTOR	
Q565	2SC3311ASTA	TRANSISTOR	
Q566	2SC3311ASTA	TRANSISTOR	
Q701	B1DEDP000003	TRANSISTOR	
Q702	2PD601AR-115	TRANSISTOR	
Q703	2PD601AR-115	TRANSISTOR	
Q704	2PB709AR-115	TRANSISTOR	
Q802	2SC1685QRSTA	TRANSISTOR	
Q803	2SC1685QRSTA	TRANSISTOR	
Q804	UNR221100L	TRANSISTOR	
Q815	2PD601AR-115	TRANSISTOR	
Q816	2PD601AR-115	TRANSISTOR	
Q820	2SD2177RTA	TRANSISTOR	
Q821	2SB14340RA	TRANSISTOR	
Q822	2SA1309ATA	TRANSISTOR	
Q823	2PD601AR-115	TRANSISTOR	
Q824	2SA1309ATA	TRANSISTOR	
Q825	2PD601AR-115	TRANSISTOR	
Q826	2PD601AR-115	TRANSISTOR	
Q827	2SB1011RL	TRANSISTOR	
Q831	2SA1309ATA	TRANSISTOR	
Q900	2PD601AR-115	TRANSISTOR	
Q901	2PD601AR-115	TRANSISTOR	
Q903	2PD601AR-115	TRANSISTOR	
Q904	2PB709AR-115	TRANSISTOR	

Q905	2PD601AR-115	TRANSISTOR	
Q906	2SD592A	TRANSISTOR	
Q907	2SB621ATA	TRANSISTOR	
Q908	B1BCBL000018	TRANSISTOR	
Q909	B1BABL000016	TRANSISTOR	
Q910	2PB709AR-115	TRANSISTOR	
Q911	2PD601AR-115	TRANSISTOR	
Q912	2SC3311ASTA	TRANSISTOR	
Q913	2SA1309ASTA	TRANSISTOR	
Q1401	2PD601AR-115	TRANSISTOR	
Q1501	2PD601AR-115	TRANSISTOR	
Q1502	2PB709AR-115	TRANSISTOR	
Q1504	2PD601AR-115	TRANSISTOR	
Q1505	2PB709AR-115	TRANSISTOR	
Q1511	2PD601AR-115	TRANSISTOR	
Q1512	2PB709AR-115	TRANSISTOR	
Q2301	2PD601AR-115	TRANSISTOR	
Q2301	UNR221600L	TRANSISTOR	
Q2302	2PD601AR-115	TRANSISTOR	
Q2303	UNR211500L	TRANSISTOR	
Q2304	2PD601AR-115	TRANSISTOR	
Q2304	UNR221600L	TRANSISTOR	
Q2305	2PD601AR-115	TRANSISTOR	
Q2306	2PB709AR-115	TRANSISTOR	
Q2307	UNR211500L	TRANSISTOR	
Q2308	2PD601AR-115	TRANSISTOR	
Q2310	2PB709AR-115	TRANSISTOR	
Q2311	2PB709AR-115	TRANSISTOR	
Q2313	UNR221100L	TRANSISTOR	
Q2314	2PD601AR-115	TRANSISTOR	
Q2314	UNR221600L	TRANSISTOR	
Q2317	UNR221600L	TRANSISTOR	
Q2318	UNR221600L	TRANSISTOR	
Q2325	2PD601AR-115	TRANSISTOR	
Q2327	2PD601AR-115	TRANSISTOR	
Q2451	2PD601AR-115	TRANSISTOR	
Q2452	2PD601AR-115	TRANSISTOR	
Q2881	UNR211D00L	TRANSISTOR	
Q2893	UNR211500L	TRANSISTOR	

Q3801	2SA1767Q	TRANSISTOR	
Q3802	2SA1767Q	TRANSISTOR	
Q3803	2SA1767Q	TRANSISTOR	
Q3804	2SC58630QL	TRANSISTOR	
Q3805	2SC58630QL	TRANSISTOR	
Q3806	2SC58630QL	TRANSISTOR	
Q3807	B1BABL000016	TRANSISTOR	
Q3808	2SC2258RL	TRANSISTOR	
Q3809	2PB709AR-115	TRANSISTOR	
Q3810	2PB709AR-115	TRANSISTOR	
Q3811	2PB709AR-115	TRANSISTOR	
Q3812	2PD601AR-115	TRANSISTOR	
Q3813	2PD601AR-115	TRANSISTOR	
Q3814	2PD601AR-115	TRANSISTOR	
RELAYS			
RL801	K6B1AGA00043	RELAY	⚠
RL802	TSE10814	RELAY	⚠
RL803	K6B1AGA00042	RELAY	⚠
RL804	TSEH0034	RELAY	
RESISTORS			
R032	ERJ6GEYJ333V	RES,M 33K-J-1/10W	
R041	ERJ6GEYJ332V	RES,M 3.3K-J-1/10W	
R075	ERJ6GEYJ101V	RES,M 100-J-1/10W	
R076	ERJ6GEYJ101V	RES,M 100-J-1/10W	
R077	ERJ6GEYJ101V	RES,M 100-J-1/10W	
R096	ERJ6GEYJ472V	RES,M 4.7K-J-1/10W	
R098	ERJ6GEYJ220V	RES,M 22-J-1/10W	
R099	ERJ6GEYJ220V	RES,M 22-J-1/10W	
R100	ERJ6GEYJ242V	RES,M 2.4K-J-1/10W	
R101	ERJ6GEYJ392V	RES,M 3.9K-J-1/10W	
R102	ERJ6GEYJ682V	RES,M 6.8K-J-1/10W	
R103	ERJ6GEYJ822V	RES,M 8.2K-J-1/10W	
R104	ERJ6GEYJ104V	RES,M 100K-J-1/10W	
R106	ERJ6GEYJ101V	RES,M 100-J-1/10W	
R107	ERJ6GEYJ101V	RES,M 100-J-1/10W	
R108	ERJ6GEYJ101V	RES,M 100-J-1/10W	
R109	ERJ6GEYJ101V	RES,M 100-J-1/10W	
R121	ERDS1VJ680T	RES, C 68-J-1/2W	

R121	ERDS2TJ680T	RES,C 68-J-1/4W	
R122	ERJ6GEYJ473V	RES,M 47K-J-1/10W	
R123	ERJ6GEYJ472V	RES,M 4.7K-J-1/10W	
R124	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W	
R125	ERJ6GEYJ101V	RES,M 100-J-1/10W	
R126	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R127	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W	
R129	ERJ6GEYJ101V	RES,M 100-J-1/10W	
R451	EROS2THF1201	RES,M 1.2K-F-1/4W	
R452	EROS2THF2201	RES,M 2.2K-F-1/4W	
R453	ERJ6GEYJ822V	RES,M 8.2K-J-1/10W	
R454	ERJ6ENF2702V	RES,M 27K-F-1/10W	
R455	ERG2FJ331H	RES,M 330-J-2W	
R456	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R457	ERDS1FJ560T	RES,C 56-J-1/2W	
R458	ERDS1FJ4R7P	RES,C 4.7-J-1/2W	
R459	ERDS1FJ4R7P	RES,C 4.7-J-1/2W	
R461	ERJ6GEYJ272V	RES,M 2.7K-J-1/10W	
R462	ERJ6GEYJ563V	RES,M 56K-J-1/10W	
R463	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W	
R464	ERDS2TJ102T	RES,C 1K-J-1/4W	
R465	ERJ6GEYJ224V	RES,M 220K-J-1/10W	
R466	ERDS1FJ4R7P	RES,C 4.7-J-1/2W	
R467	ERDS1FJ4R7P	RES,C 4.7-J-1/2W	
R468	ERJ6GEYJ272V	RES,M 2.7K-J-1/10W	
R469	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R470	ERJ6GEYJ272V	RES,M 2.7K-J-1/10W	
R471	ERJ6ENF1802V	RES,M 18K-F-1/10W	
R472	ERJ6ENF1501V	RES,M 1.5K-F-1/10W	
R473	ERJ6GEYJ272V	RES,M 2.7K-J-1/10W	
R474	ERJ6GEYJ563V	RES,M 56K-J-1/10W	
R475	ERJ6GEYJ224V	RES,M 220K-J-1/10W	
R476	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W	
R501	ERDS2TJ104T	RES,C 100K-J-1/4W	
R502	ERG2FJ390H	RES,M 39-J-2W	
R503	ERG3FJ221H	RES,M 220-J-3W	
R504	ERDS2TJ680T	RES,C 68-J-1/4W	
R505	ERG1SJ102P	RES,M 1K-J-1W	
R507	ERX2FJR22H	RES,M .22-J-2W	

R510	ERG3FJ561H	RES,M 560-J-3W	
R512	ERDS2TJ102T	RES,C 1K-J-1/4W	
R513	ERDS2TJ471T	RES,C 470-J-1/4W	
R514	EROS2THF2102	RES,M 21K-F-1/4W	⚠
R515	EROS2THF2102	RES,M 21K-F-1/4W	⚠
R516	ERDS2TJ101T	RES,C 100-J-1/4W	⚠
R517	ERC14GK103V	RES,M 10K-J-1W	
R518	ERDS2TJ103T	RES,C 10K-J-1/4W	
R519	ERDS2TJ221T	RES,C 220-J-1/4W	
R520	EROS2THF2102	RES,M 21K-F-1/4W	⚠
R521	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R522	ERJ6GEYJ392V	RES,M 3.9K-J-1/10W	
R523	ERJ6GEYJ473V	RES,M 47K-J-1/10W	
R524	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R525	ERJ6GEYJ182V	RES,M 1.8K-J-1/10W	
R526	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R527	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W	
R528	ERDS2TJ473T	RES,C 47K-J-1/4W	
R529	ERDS2TJ473T	RES,C 47K-J-1/4W	
R530	ERJ6GEYJ183V	RES,M 18K-J-1/10W	
R531	ERDS2TJ221T	RES,C 220-J-1/4W	
R533	ERDS2TJ102T	RES,C 1K-J-1/4W	
R534	ERDS2TJ152T	RES,C 1.5K-J-1/4W	
R535	ERDS2TJ472T	RES,C 4.7K-J-1/4W	
R536	ERDS2TJ221T	RES,C 220-J-1/4W	
R537	ERDS2TJ103T	RES,C 10K-J-1/4W	
R538	ERDS2TJ472T	RES,C 4.7K-J-1/4W	
R540	ERC14GK334V	RES,C 330K-K-1/4W	
R541	ERDS2TJ101T	RES,C 100-J-1/4W	
R542	ERDS2TJ103T	RES,C 10K-J-1/4W	
R543	ERDS2TJ103T	RES,C 10K-J-1/4W	
R547	ERG1SJ392P	RES,M 3.9K-J-1W	
R548	ERG3FJ202H	RES,M 2K-J-3W	
R549	ERG3FJ152H	RES,M 1.5K-J-3W	
R550	ERDS2TJ471T	RES,C 470-J-1/4W	
R551	ERC14GK184V	RES,C 180K-K-1/4	
R552	ERC14GK224V	RES,C 220K-K-1/4W	
R553	ERDS2TJ101T	RES,C 100-J-1/4W	

R554	ERDS2TJ473T	RES,C 47K-J-1/4W	
R557	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R558	ERDS2TJ332T	RES,C 3.3K-J-1/4W	
R558	ERDS2TJ473T	RES,C 47K-J-1/4W	
R559	ERC12GK104V	RES,C 100K-K-1/2W	
R560	ERC12GK225V	RES,C 2.2M-K-1/2W	
R560	ERDS2TJ102T	RES,C 1K-J-1/4W	
R561	EROS2THF2102	RES,M 21K-F-1/4W	⚠
R562	ERDS2TJ133T	RES,C 13K-J-1/4W	
R562	ERJ6GEYJ102V	RES,M 1K-J-1/10W	
R563	ERDS2TJ102T	RES,C 1K-J-1/4W	
R563	ERG2FJ123H	RES,M 12K-J-2W	
R564	ERDS2TJ101T	RES,C 100-J-1/4W	
R565	ERDS2TJ560T	RES,C 56-J-1/4W	
R566	ERDS2TJ101T	RES,C 100-J-1/4W	
R568	ERDS2TJ473T	RES,C 47K-J-1/4W	
R568	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R569	ERJ6GEYJ223V	RES,M 22K-J-1/10W	
R570	ERDS2TJ103T	RES,C 10K-J-1/4W	
R572	ERJ6GEYJ104V	RES,M 100K-J-1/10W	
R573	ERC14GK101V	RES,C 100-K-1/4W	
R574	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R575	ERJ6GEYJ102V	RES,M 1K-J-1/10W	
R576	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R577	EROS2THF2703	RES,M 270K-F-1/4W	
R578	ERJ6GEYJ331V	RES,M 330-J-1/10W	
R579	ERDS2TJ392T	RES,C 3.9K-J-1/4W	
R580	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R581	ERJ6GEYJ101V	RES,M 100-J-1/10W	
R582	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R583	ERJ6ENF1501V	RES,M 1.5K-F-1/10W	
R584	ERJ6ENF2201V	RES,M 2.2K-F-1/10W	
R586	EROS2THF2003	RES,M 200K-F-1/4W	
R587	ERJ6GEYJ681V	RES,M 680-J-1/10W	
R589	ERJ6GEYJ392V	RES,M 3.9K-J-1/10W	
R590	ERJ6GEYJ331V	RES,M 330-J-1/10W	
R591	ERDS2TJ100T	RES,C 10-J-1/4W	
R592	ERJ6GEYJ332V	RES,M 3.3K-J-1/10W	

R593	ERJ6GEYJ152V	RES,M 1.5K-J-1/10W	
R594	ERJ6GEYJ332V	RES,M 3.3K-J-1/10W	
R595	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R597	ERF5AJ680	RES,W 68-J-5W	
R598	ERX12SJR22P	RES,M .22-J-1/2W	
R598	ERX12SJR27P	RES,M .27-J-1/2W	
R599	ERX12SJR27P	RES,M .27-J-1/2W	
R599	ERX12SZJR15P	RES,M .15-J-1/2W	
R701	ERQ14AJ220P	RES,F 22-J-1/4W	
R702	ERJ6GEYJ473V	RES,M 47K-J-1/10W	
R703	ERJ6GEYJ223V	RES,M 22K-J-1/10W	
R704	ERJ6GEYJ184V	RES,M 180K-J-1/10W	
R705	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R718	ERG2FJ223H	RESM 22K-J-2W	
R732	EROS2THF6342	RES,M 63.4K-F-1/4W	
R733	EROS2THF6342	RES,M 63.4K-F-1/4W	
R734	EROS2THF1542	RES,M 15.4KF-1/4W	
R735	ERDS1FJ220P	RES,C 22-F-1/2W	
R736	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R784	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R785	ERJ6GEYJ101V	RES,M 100-J-1/10W	
R786	ERJ6GEYJ101V	RES,M 100-J-1/10W	
R787	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R800	ERU5TCK1R5T	RES,F 1.5-K-5W	⚠
R801	ERC14GK824V	RES,C 820K-K-1/4W	
R802	ERDS2TJ102T	RES,C 1K-J-1/4W	
R803	ERDS2TJ680T	RES,C 68-J-1/4W	
R804	ERDS2TJ331T	RES,C 330-J-1/4W	
R805	ERDS2TJ473T	RES,C 47K-J-1/4W	
R806	ERDS2TJ473T	RES,C 47K-J-1/4W	
R807	ERDS2TJ820T	RES,C 82-J-1/4W	
R808	ERDS2TJ680T	RES,C 68-J-1/4W	
R809	ERDS2TJ472T	RES,C 4.7K-J-1/4W	
R810	ERJ6GEYJ473V	RES,M 47K-J-1/10W	
R811	ERDS2TJ472T	RES,C 4.7K-J-1/4W	
R812	ERDS2TJ473T	RES,C 47K-J-1/4W	
R814	ERJ6GEYJ473V	RES,M 47K-J-1/10W	
R815	ERJ6GEYJ223V	RES,M 22K-J-1/10W	

R815	ERJ6GEYJ333V	RES,M 33K-J-1/10W	
R816	ERD75TAJ825	RES,C 8.2MEG-J-3/4W	⚠
R816	ERJ6GEYJ223V	RES,M 22K-J-1/10W	
R817	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W	
R818	ERDS2TJ222T	RES,C 2.2K-J-1/4W	
R819	ERDS2TJ101T	RES,C 100-J-1/4W	
R819	ERDS2TJ391T	RES,C 390-J-1/4W	
R820	ERJ6GEYJ122V	RES,M 1.2K-J-1/10W	
R830	ERDS1FJ330T	RES,C 30-J-1/2W	
R831	ERJ6GEYJ101V	RES,M 100-J-1/10W	
R832	ERJ6GEYJ102V	RES,M 1K-J-1/10W	
R833	ERJ6GEYJ470V	RES,M 47-J-1/10W	
R834	ERDS2TJ473T	RES,C 47K-J-1/4W	
R835	ERJ6GEYJ392V	RES,M 3.9K-J-1/10W	
R840	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W	
R841	ERQ12HKR22P	RES,F .22-K-1/2W	
R842	ERQ12HKR22P	RES,F .22-K-1/2W	
R844	ERJ6GEYJ472V	RES,M 4.7K-J-1/10W	
R845	ERDS1FJ222T	RES,C 2200-J-1/2W	
R846	ERJ6GEYJ473V	RES,M 47K-J-1/10W	
R847	ERJ6GEYJ472V	RES,M 4.7K-J-1/10W	
R848	ERJ6GEYJ473V	RES,M 47K-J-1/10W	
R849	ERDS2TJ223T	RES,C 22K-J-1/4W	
R849	ERJ6GEYJ223V	RES,M 22K-J-1/10W	
R850	ERDS2TJ152T	RES,C 1.5K-J-1/4W	
R851	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R852	ER050PHF2702	RES,M 27-F-1/2W	
R853	EROS2THF3601	RES,M 3.6K-F-1/4W	
R855	ERDS2TJ683T	RES,C 68K-J-1/4W	
R856	ERJ6GEYJ123V	RES,M 12K-J-1/10W	
R857	ERX1SJ1R2P	RES,M 1.2-J-1W	
R858	ERX1SJ1R2P	RES,M 1.2-J-1W	
R859	ERDS2TJ272T	RES,C 2.7K-J-1/4W	
R860	ERG1SJ102P	RES,M 1K-J-1W	
R861	ERX12SJR27P	RES,M .27-J-1/2W	
R862	ERX12SJR27P	RES,M .27-J-1/2W	
R863	ERX12SJR27P	RES,M .27-J-1/2W	
R864	ERJ6GEYJ104V	RES,M 100K-J-1/10W	

R865	ERJ6GEYJ332V	RES,M 3.3K-J-1/10W	
R866	ERJ6GEYJ561V	RES,M 560-J-1/10W	
R867	ERJ6GEYJ122V	RES,M 1.2K-J-1/10W	
R868	ERJ6GEYJ104V	RES,M 100K-J-1/10W	
R869	ERJ6GEYJ332V	RES,M 3.3K-J-1/10W	
R870	ERDS2TJ102T	RES,C 1K-J-1/4W	
R872	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R872	ERJ6GEYJ104V	RES,M 100K-J-1/10W	
R873	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R874	ERDS1FJ390T	RES,C 39-J-1/2W	
R875	ERJ6GEYJ332V	RES,M 3.3K-J-1/10W	
R876	ERJ6GEYJ104V	RES,M 100K-J-1/10W	
R878	ERDS2TJ223T	RES,C 22K-J-1/4W	
R879	ERJ6ENF6801V	RES,M 6.8K-F-1/10W	
R882	ERJ6GEYJ104V	RES,M 100K-J-1/10W	
R884	ERX1SJ1R8P	RES,M 1.8-J-1W	
R886	ERDS2TJ272T	RES,C 2.7K-J-1/4W	
R886	ERJ6GEYJ272V	RES,M 2.7K-J-1/10W	
R887	ERJ6GEYJ473V	RES,M 47K-J-1/10W	
R888	ERJ6GEYJ472V	RES,M 4.7K-J-1/10W	
R889	ERJ6GEYJ272V	RES,M 2.7K-J-1/10W	
R890	ERDS2TJ152T	RES,C 1.5K-J-1/4W	
R891	ERG1SJ823P	RES,M 82K-J-1W	
R892	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W	
R893	ERDS1FJ332T	RES,C 3.3K-F-1/2W	
R894	ERJ6ENF1801V	RES,M 1.8K-F-1/10W	
R896	ERDS1TJ334T	RES,C 330K-J-1/2W	
R898	ERJ6GEYJ563V	RES,M 56K-J-1/10W	
R899	ERJ6GEYJ223V	RES,M 22K-J-1/10W	
R900	ERJ6GEYJ101V	RES,M 100-J-1/10W	
R901	ERJ6GEYJ101V	RES,M 100-J-1/10W	
R902	ERJ6GEYJ682V	RES,M 6.8K-J-1/10W	
R903	ERJ6GEYJ223V	RES,M 22K-J-1/10W	
R904	ERJ6GEYJ392V	RES,M 3.9K-J-1/10W	
R906	ERJ6GEYJ333V	RES,M 33K-J-1/10W	
R907	ERJ6GEYJ681V	RES,M 680-J-1/10W	
R908	ERJ6GEYJ151V	RES,M 150-J-1/10W	
R912	ERDS2TJ681T	RES,C 680-J-1/4W	
R915	ERDS2TJ221T	RES,C 220-J-1/4W	

R916	ERDS2TJ221T	RES,C 220-J-1/4W	
R917	ERQ14AJ100P	RES,F 10-J-1/4W	
R924	ERDS2TJ561T	RES,C 560-J-1/4W	
R925	ERDS2TJ683T	RES,C 68K-J-1/4W	
R926	ERDS2TJ683T	RES,C 68K-J-1/4W	
R927	ERDS2TJ561T	RES,C 560-J-1/4W	
R928	ERQ12AJ151P	RES,F 150-J-1/2W	
R929	ERQ14AJ2R2P	RES,F 2.2-J-1/4W	
R930	ERDS2TJ820T	RES,C 82-J-1/4W	
R931	ERQ14AJ2R2P	RES,F 2.2-J-1/4W	
R932	ERQ14AJ3R3P	RES,F 3.3-J-1/4W	
R933	ERQ14AJ3R3P	RES,F 3.3-J-1/4W	
R934	ERQ1CJP331S	RES,F 330-J-1W	
R935	ERG2FJ391H	RES,M 390-J-2W	
R937	ERJ6GEYJ121V	RES,M 120-J-1/10W	
R940	ERDS2TJ102T	RES,C 1K-J-1/4W	
R941	ERDS2TJ102T	RES,C 1K-J-1/4W	
R942	ERG2FJ391H	RES,M 390-J-2W	
R1051	ERJ6ENF1002V	RES,M 10K-F-1/10W	
R1052	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W	
R1053	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W	
R1054	ERJ6GEYJ332V	RES,M 3.3K-J-1/10W	
R1055	ERJ6GEYJ512V	RES,M 5.1K-J-1/10W	
R1056	ERJ6GEYJ912V	RES,M 9.1K-J-1/10W	
R1057	ERJ6GEYJ223V	RES,M 22K-J-1/10W	
R1058	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R1059	ERJ6GEYJ102V	RES,M 1K-J-1/10W	
R1060	ERJ6GEYJ470V	RES,M 47-J-1/10W	
R1061	ERJ6GEYJ101V	RES,M 100-J-1/10W	
R1062	ERJ6GEYJ182V	RES,M 1.8K-J-1/10W	
R1063	ERJ6GEYJ133V	RES,M 13K-J-1/10	
R1064	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R1401	ERJ6ENF3902V	RES,M 39K-F-1/10W	
R1402	ERJ6ENF3012V	RES,M 30.1K-F-1/16W	
R1403	ERJ6GEYJ472V	RES,M 4.7K-J-1/10W	
R1404	ERJ6ENF8201V	RES,M 8.2K-F-1/10W	
R1405	ERJ6ENF9101V	RES,M 9.1K-F-1/10W	
R1406	ERJ6ENF2101V	RES,M 2.1K-F-1/10W	
R1407	ERJ6ENF6800V	RES,M 680-F-1/10W	

R1408	ERJ6GEYJ472V	RES,M 4.7K-J-1/10W	
R1409	ERDS2TJ473T	RES,C 47K-J-1/4W	
R1410	ERJ6GEYJ473V	RES,M 47K-J-1/10W	
R1411	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R1507	ERJ6ENF4701V	RES,M 4.7K-F-1/10W	
R1508	ERJ6ENF1002V	RES,M 10K-F-1/10W	
R1512	ERJ6ENF1002V	RES,M 10K-F-1/10W	
R1514	ERJ6GEYJ102V	RES,M 1K-J-1/10W	
R1515	ERJ6GEYJ104V	RES,M 100K-J-1/10W	
R1518	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R1522	ERJ6GEYJ330V	RES,M 33-J-1/10W	
R1523	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W	
R1526	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R1527	ERJ6GEYJ472V	RES,M 4.7K-J-1/10W	
R1529	ERJ6GEYJ472V	RES,M 4.7K-J-1/10W	
R1530	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R1531	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R1534	ERJ6ENF2201V	RES,M 2.2K-F-1/10W	
R1536	ERJ6ENF1962V	RES,M 19.6K-F-1/10W	
R1537	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R1569	ERJ6GEYJ472V	RES,M 4.7K-J-1/10W	
R1583	ERJ6ENF5761V	RES,M 5.76K-F-1/10W	
R1585	ERJ6ENF3651V	RES,M 3.65K-F-1/16W	
R1587	ERJ6ENF2202V	RES,M 22K-F-1/10W	
R1588	ERJ6GEYJ152V	RES,M 1.5K-J-1/10W	
R1591	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W	
R1592	ERJ6GEYJ152V	RES,M 1.5K-J-1/10W	
R1593	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R1599	ERJ6GEYJ472V	RES,M 4.7K-J-1/10W	
R2203	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W	
R2206	ERJ6GEYJ102V	RES,M 1K-J-1/10W	
R2207	ERJ6GEYJ102V	RES,M 1K-J-1/10W	
R2221	ERJ6GEYJ101V	RES,M 100-J-1/10W	
R2301	ERJ6ENF1100V	RES,M 110-F-1/10W	
R2302	ERJ6ENF1202V	RES.M 1.2K-F-1/10W	
R2302	ERJ6ENF5232V	RES,M 5.32K-F-1/10W	
R2303	ERJ6ENF1100V	RES,M 110-F-1/10W	
R2304	ERJ6ENF1202V	RES.M 1.2K-F-1/10W	
R2304	ERJ6ENF4701V	RES,M 4.7K-F-1/10W	

R2307	ERJ6ENF1202V	RES.M 1.2K-F-1/10W	
R2308	ERJ6GEYJ223V	RES,M 22K-J-1/10W	
R2309	ERJ6GEYJ102V	RES,M 1K-J-1/10W	
R2309	ERJ6GEYJ223V	RES,M 22K-J-1/10W	
R2310	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R2312	ERJ6ENF1303V	RES,M 130K-F-1/10W	
R2313	ERJ6GEYJ223V	RES,M 22K-J-1/10W	
R2314	ERJ6ENF1202V	RES.M 1.2K-F-1/10W	
R2315	ERJ6GEYJ683V	RES,M 68K-J-1/10W	
R2316	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R2317	ERJ6ENF4701V	RES,M 4.7K-F-1/10W	
R2318	ERJ6GEYJ101V	RES,M 100-J-1/10W	
R2319	ERJ6ENF1202V	RES.M 1.2K-F-1/10W	
R2320	ERJ6ENF1202V	RES.M 1.2K-F-1/10W	
R2322	ERJ6GEYJ102V	RES,M 1K-J-1/10W	
R2324	ERJ6GEYJ102V	RES,M 1K-J-1/10W	
R2325	ERJ6GEYJ102V	RES,M 1K-J-1/10W	
R2326	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R2328	ERJ6GEYJ223V	RES,M 22K-J-1/10W	
R2329	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R2331	ERJ6ENF5232V	RES,M 5.32K-F-1/10W	
R2332	ERJ6GEYJ102V	RES,M 1K-J-1/10W	
R2332	ERJ6GEYJ392V	RES,M 3.9K-J-1/10W	
R2333	ERJ6GEYJ183V	RES,M 18K-J-1/10W	
R2334	ERJ6GEYJ102V	RES,M 1K-J-1/10W	
R2335	ERJ6GEYJ271V	RES,M 270-J-1/10W	
R2336	ERJ6GEYJ332V	RES,M 3.3K-J-1/10W	
R2337	ERJ6GEYJ271V	RES,M 270-J-1/10W	
R2340	ERJ6GEYJ104V	RES,M 100K-J-1/10W	
R2342	ERJ6GEYJ101V	RES,M 100-J-1/10W	
R2344	ERJ6GEYJ104V	RES,M 100K-J-1/10W	
R2345	ERJ6GEYJ683V	RES,M 68K-J-1/10W	
R2347	ERJ6GEYJ473V	RES,M 47K-J-1/10W	
R2351	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R2352	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R2353	ERJ6GEYJ183V	RES,M 18K-J-1/10W	
R2354	ERJ6GEYJ432V	RES,M 4.3K-J-1/10W	
R2355	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R2356	ERJ6GEYJ103V	RES,M 10K-J-1/10W	

R2357	ERJ6GEYJ332V	RES,M 3.3K-J-1/10W	
R2358	ERJ6GEYJ183V	RES,M 18K-J-1/10W	
R2359	ERJ6GEYJ432V	RES,M 4.3K-J-1/10W	
R2360	ERJ6GEYJ102V	RES,M 1K-J-1/10W	
R2361	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R2362	ERJ6GEYJ473V	RES,M 47K-J-1/10W	
R2363	ERDS2TJ102T	RES,C 1K-J-1/4W	
R2365	ERJ6GEYJ102V	RES,M 1K-J-1/10W	
R2366	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R2367	ERJ6GEYJ473V	RES,M 47K-J-1/10W	
R2368	ERJ6GEYJ102V	RES,M 1K-J-1/10W	
R2372	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R2373	ERJ6GEYJ333V	RES,M 33K-J-1/10W	
R2374	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R2375	ERJ6GEYJ682V	RES,M 6.8K-J-1/10W	
R2379	ERJ6GEYJ473V	RES,M 47K-J-1/10W	
R2384	ERJ6GEYJ472V	RES,M 4.7K-J-1/10W	
R2385	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R2396	ERDS2TJ102T	RES,C 1K-J-1/4W	
R2404	ERJ6GEYJ152V	RES,M 1.5K-J-1/10W	
R2422	ERJ6GEYJ683V	RES,M 68K-J-1/10W	
R2451	ERJ6GEYJ101V	RES,M 100-J-1/10W	
R2452	ERJ6GEYJ101V	RES,M 100-J-1/10W	
R2453	ERJ6GEYJ681V	RES,M 680-J-1/10W	
R2454	ERJ6GEYJ471V	RES,M 470-J-1/10W	
R2456	ERJ6GEYJ681V	RES,M 680-J-1/10W	
R2457	ERJ6GEYJ471V	RES,M 470-J-1/10W	
R2851	ERX2SJS1R3H	RES,M 1.3-J-2W	
R2852	ERJ6ENF1202V	RES.M 1.2K-F-1/10W	
R2853	ERJ6ENF1911V	RES,M 1.91K-F-1/10W	
R2854	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R2856	ERJ6ENF1651V	RES,M 1.65K-F-1/10W	
R2857	ERJ6ENF1021V	RES,M 1.02K-F-1/10W	
R2858	ERJ6ENF1541V	RES,M 1.54K-F-1/10W	
R2859	ERJ6ENF1471V	RES,M 1.47K-F-1/10W	
R2860	ERJ6ENF4300V	RES,M 430-F-1/10W	
R2861	ERJ6ENF1001V	RES,M 1K-F-1/10W	
R2862	ERJ6ENF3001V	RES,M 3K-F-1/10W	
R2863	ERJ6ENF1001V	RES,M 1K-F-1/10W	

R2863	ERJ6ENF9760V	RES,M 976-F-1/10W	
R2883	ERJ6GEYJ104V	RES,M 100K-J-1/10W	
R2892	ERJ6ENF1002V	RES,M 10K-F-1/10W	
R3301	ERJ6GEYJ184V	RES,M 180K-J-1/10W	
R3302	ERJ6GEYJ184V	RES,M 180K-J-1/10W	
R3303	ERJ6ENF75R0V	RES,M 75.0-F-1/10W	
R3304	ERJ6ENF75R0V	RES,M 75.0-F-1/10W	
R3305	ERJ6GEYJ184V	RES,M 180K-J-1/10W	
R3306	ERJ6ENF75R0V	RES,M 75.0-F-1/10W	
R3307	ERJ6GEYJ184V	RES,M 180K-J-1/10W	
R3308	ERJ6ENF75R0V	RES,M 75.0-F-1/10W	
R3309	ERJ6ENF75R0V	RES,M 75.0-F-1/10W	
R3310	ERJ6ENF75R0V	RES,M 75.0-F-1/10W	
R3311	ERJ6ENF75R0V	RES,M 75.0-F-1/10W	
R3312	ERJ6ENF75R0V	RES,M 75.0-F-1/10W	
R3313	ERJ6ENF75R0V	RES,M 75.0-F-1/10W	
R3314	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R3315	ERJ6GEYJ184V	RES,M 180K-J-1/10W	
R3316	ERJ6GEYJ184V	RES,M 180K-J-1/10W	
R3317	ERJ6ENF75R0V	RES,M 75.0-F-1/10W	
R3318	ERJ6ENF75R0V	RES,M 75.0-F-1/10W	
R3319	ERJ6ENF75R0V	RES,M 75.0-F-1/10W	
R3320	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R3321	ERJ6GEYJ184V	RES,M 180K-J-1/10W	
R3322	ERJ6GEYJ184V	RES,M 180K-J-1/10W	
R3323	ERJ6ENF75R0V	RES,M 75.0-F-1/10W	
R3324	ERJ6GEYJ184V	RES,M 180K-J-1/10W	
R3326	ERJ6GEYJ184V	RES,M 180K-J-1/10W	
R3327	ERJ6GEYJ184V	RES,M 180K-J-1/10W	
R3328	ERJ6GEYJ184V	RES,M 180K-J-1/10W	
R3403	ERJ6GEYJ224V	RES,M 220K-J-1/10W	
R3404	ERJ6GEYJ224V	RES,M 220K-J-1/10W	
R3801	ERJ6GEYJ560V	RES,M 56-J-1/10W	
R3802	ERJ6GEYJ560V	RES,M 56-J-1/10W	
R3803	ERJ6GEYJ560V	RES,M 56-J-1/10W	
R3804	ERJ6GEYJ104V	RES,M 100K-J-1/10W	
R3805	ERDS2TJ471T	RES,C 470-J-1/4W	
R3806	ERJ6GEYJ102V	RES,M 1K-J-1/10W	
R3807	EROS2THF3013	RES,M 301K-F-1/4W	

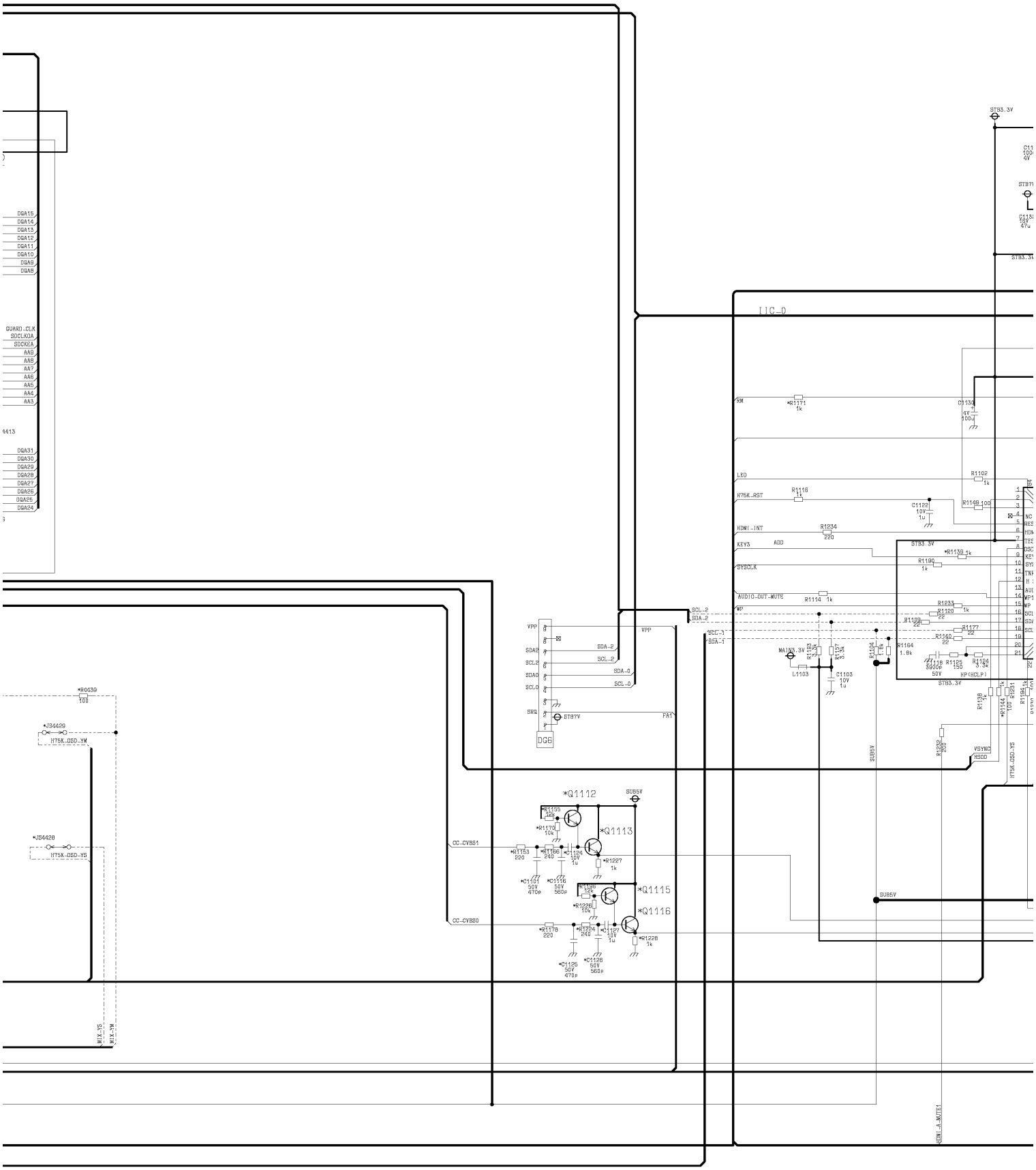
R3808	ERJ6ENF1402V	RES,M 14K-F-1/10W	
R3809	ERJ6GEYJ330V	RES,M 33-J-1/10W	
R3810	ERJ6GEYJ102V	RES,M 1K-J-1/10W	
R3811	ERJ6GEYJ104V	RES,M 100K-J-1/10W	
R3812	ERJ6GEYJ330V	RES,M 33-J-1/10W	
R3813	ERJ6GEYJ102V	RES,M 1K-J-1/10W	
R3814	EROS2THF3013	RES,M 301K-F-1/4W	
R3815	ERJ6ENF1402V	RES,M 14K-F-1/10W	
R3816	ERJ6GEYJ330V	RES,M 33-J-1/10W	
R3817	ERJ6GEYJ102V	RES,M 1K-J-1/10W	
R3818	ERDS2TJ224T	RES,C 220K-J-1/4W	
R3819	ERJ6GEYJ102V	RES,M 1K-J-1/10W	
R3820	ERDS2TJ224T	RES,C 220K-J-1/4W	
R3821	ERDS2TJ104T	RES,C 100K-J-1/4W	
R3822	EROS2THF3013	RES,M 301K-F-1/4W	
R3823	ERDS2TJ224T	RES,C 220K-J-1/4W	
R3824	ERC12GK101V	RES,C 100-K-1/2W	
R3825	ERC12GK101V	RES,C 100-K-1/2W	
R3826	ERC12GK101V	RES,C 100-K-1/2W	
R3827	ERJ6ENF1402V	RES,M 14K-F-1/10W	
R3828	ERJ6GEYJ104V	RES,M 100K-J-1/10W	
R3829	ERJ6GEYJ102V	RES,M 1K-J-1/10W	
R3830	ERG1SJ682P	RES,M 6.8K-J-1W	
R3831	ERG2FJ333H	RES,M 33K-J-2W	
R3832	ERDS2TJ151T	RES,C 150-J-1/4W	
R3833	ERDS2TJ151T	RES,C 150-J-1/4W	
R3834	ERDS2TJ151T	RES,C 150-J-1/4W	
R3836	ERG2FJ101H	RES,M 100-J-2W	
R3843	ERDS2TJ224T	RES,C 220K-J-1/4W	
R3844	EROS2THF8871	RES,M 8.87K-F-1/4W	
R3845	ERJ6ENF33R0V	RES,M 33.OK-F-1/10W	
R3846	ERJ6ENF33R0V	RES,M 33.OK-F-1/10W	
R3847	ERJ6ENF33R0V	RES,M 33.OK-F-1/10W	
R3848	ERJ6ENF2200V	RES,M 220-F-1/10W	
R3849	ERJ6ENF2200V	RES,M 220-F-1/10W	
R3850	ERJ6ENF2200V	RES,M 220-F-1/10W	
R3851	ERJ6GEYJ391V	RES,M 390-J-1/10W	
R3852	ERJ6GEYJ391V	RES,M 390-J-1/10W	
R3853	ERJ6GEYJ391V	RES,M 390-J-1/10W	

R3857	ERG2FJ393H	RES,M 39K-J-2W	
R5501	ERJ6GEYJ153V	RES,M 15K-J-1/10W	
R5502	ERJ6GEYJ153V	RES,M 15K-J-1/10W	
R5504	ERJ6GEYJ101V	RES,M 100-J-1/10W	
R5505	ERJ6GEYJ101V	RES,M 100-J-1/10W	
R5507	ERJ6GEYJ101V	RES,M 100-J-1/10W	
R5508	ERJ6GEYJ101V	RES,M 100-J-1/10W	
R5511	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
R5801	ERJ6GEYJ153V	RES,M 15K-J-1/10W	
R5802	ERJ6GEYJ104V	RES,M 100K-J-1/10W	
R5804	ERG1SJ470P	RES,M 47-J-1W	
R5805	ERDS1FJ1R0T	RES,C 1.0-J-1/2W	
R5806	ERJ6ENF5602V	RES,M 56K-F-1/10W	
R5807	ERJ6ENF2001V	RES,M 2K-F-1/10W	
R5808	ERDS1FJ391T	RES,C 390-J-1/2W	
R5809	ERX12SJR68P	RES,M .68-J-1/2W	
R5810	ERX12SJR47P	RES,M .47-J-1/2W	
R5811	ERDS2TJ102T	RES,C 1K-J-1/4W	
R5812	ERDS2TJ822T	RES,C 8.2K-J-1/4W	
R5813	ERDS1FJ391T	RES,C 390-J-1/2W	
R5815	ERJ6GEYJ103V	RES,M 10K-J-1/10W	
SWITCHES			
SW001	EVQPBD05R	SWITCH	
SW002	EVQPBD05R	SWITCH	
SW003	EVQPBD05R	SWITCH	
SW004	EVQPBD05R	SWITCH	
SW005	EVQPBD05R	SWITCH	
SW006	EVQPBD05R	SWITCH	
SW007	EVQPBD05R	SWITCH	
SW008	EVQPBD05R	SWITCH	
TRANSFORMERS			
T501	ETH19K207AZ	TRANSFORMER	
T550	G4E1A0000011	TRANSFORMER	
T551	ZTFN95006A	TRANSFORMER,FLYBACK	⚠
T553	ETS28AU2K9AD	TRANSFORMER	
T561	ETF18L101A	TRANSFORMER	
T801	ETS42AU185AD	TRANSFORMER	⚠
T802	ETP28KBZA1ZG	TRANSFORMER	⚠

T3023	G0BYYYY00016	TRANSFORMER	
OTHERS			
TNR001	ENGF6302GF	TUNER	⚠
TNR002	ENG36A08GF	TUNER	⚠
1	M80LSW095X	CRT	⚠
M001	K3B10CA00041	CRT SOCKET	
2	TLY2AA039	YOKE DEFLECTION	⚠
M002	TXFYA010EEW	DAG GROUND	
3	TSP2AA034	DEGAUSSING COIL	⚠
4	TSP2AF007	ROTATION COIL	
5	TSP2AF009	GEOMAGNETIC COIL	
6	EASG12S503A2	WOOFER SPEAKER	
7	EASG7DH08E2	TWEETER	
M003	TKP2AA1311S	SPEAKER BOX BASE	
M004	TXFKP10JSER	SPEAKER BOX COVER	
8	TBX2AA0241	DISC BUTTON	
9	TBX2AA0251	FUNCTION KEY BUTTONS	
10	TKX2AA0201	LED GUIDE	
11	TKX2AA0211	IR GUIDE	
12	TEK6935	DOOR CATCH	
13	TKP2AA1122S	DOOR PANEL	
M005	TMW2A97121	BRKT A/C CORD	
M006	TMZ2AC50011	BRACKET SUPPORT CRT	
M007	TSM2AA001	MAGNET, PERMALLOY	
M008	TSN63115-4	MAGNET, PURITY	
M009	TSX2AA0411	LINE CORD	⚠
M010	TXFKP11JSER	A/V BRACKET	
14	TXFKU01HG4S	CABINET BACK	
15	TXFKY01HG4S	CABINET FRONT	
JK3301	TJB2AA0521	CONNECTOR	
JK3401	TJB2AA0511	CONNECTOR	
JK3302A	TJB2AA0532	CONNECTOR	
JK3804A	K3B10CA00041	CONNECTOR	
ACCESORIES			
M011	TQB2AA0500	OWNERS MANUAL	
M012	EUR7603ZF0	REMOTE CONTROL	

M013	EUR7603ZFA	REMOTE CONTROL	
M014	UR76EC0303E	BATTERY COVER REMOTE CONTROLS	

TOP PREVIOUS


IIC-0
STB3.3V
SUB5V
H75K-RST
HDMI-INT
KEY3
SYSCLK
AUDIO-OUT-MUTE
SCL-2
SDA-2
SCL-1
SDA-1
SCL-0
SDA-0
VPP
STB7V
DGB
*Q1112
*Q1113
*Q1115
*Q1116
CC-CVBS1
CC-CVBS0
*JS4429
H75K-OSD-YM
*JS4428
H75K-OSD-YS
MIX-YS
MIX-YM
HP(HCLP)
HDMI-A-MUTE1

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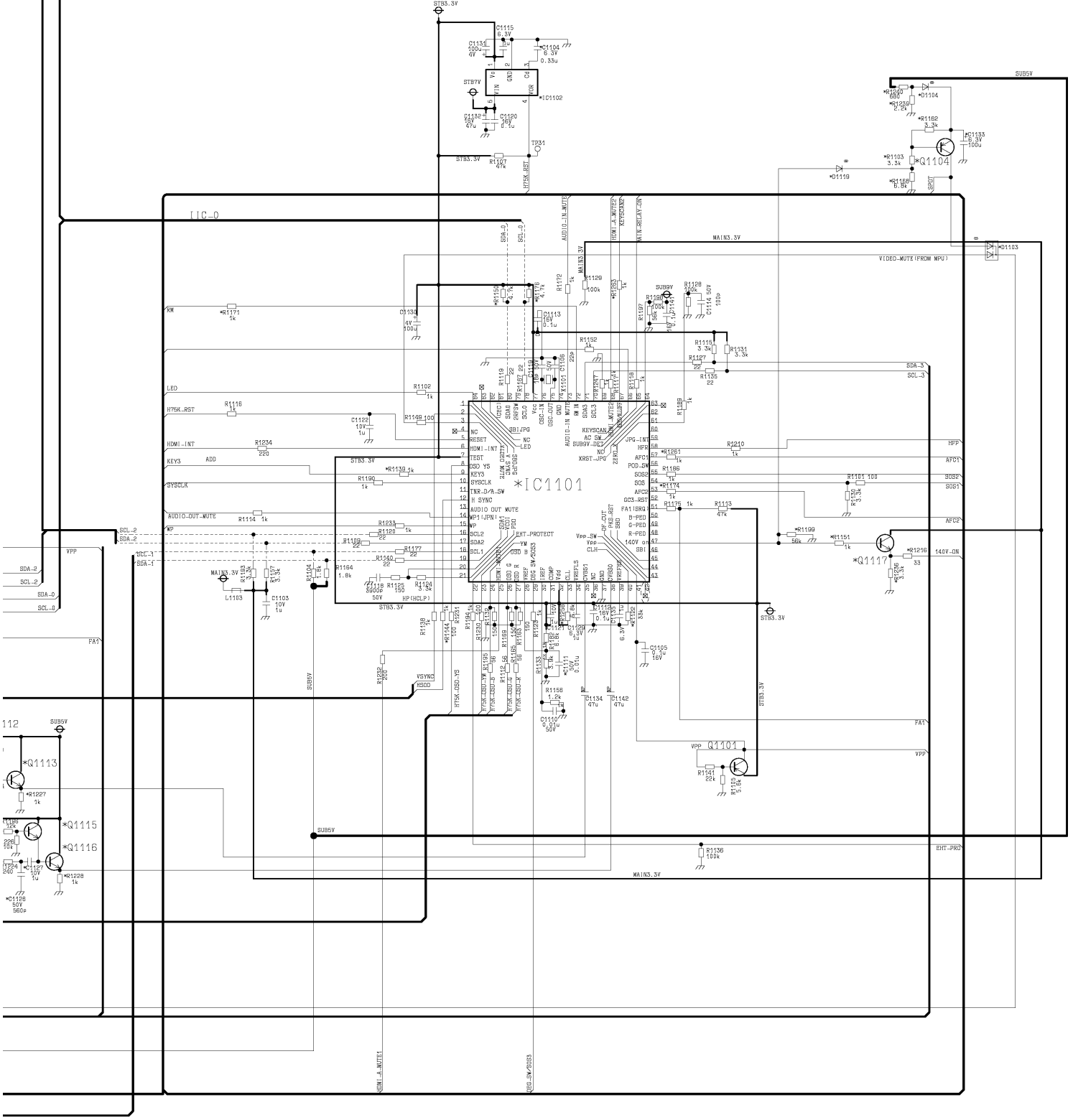

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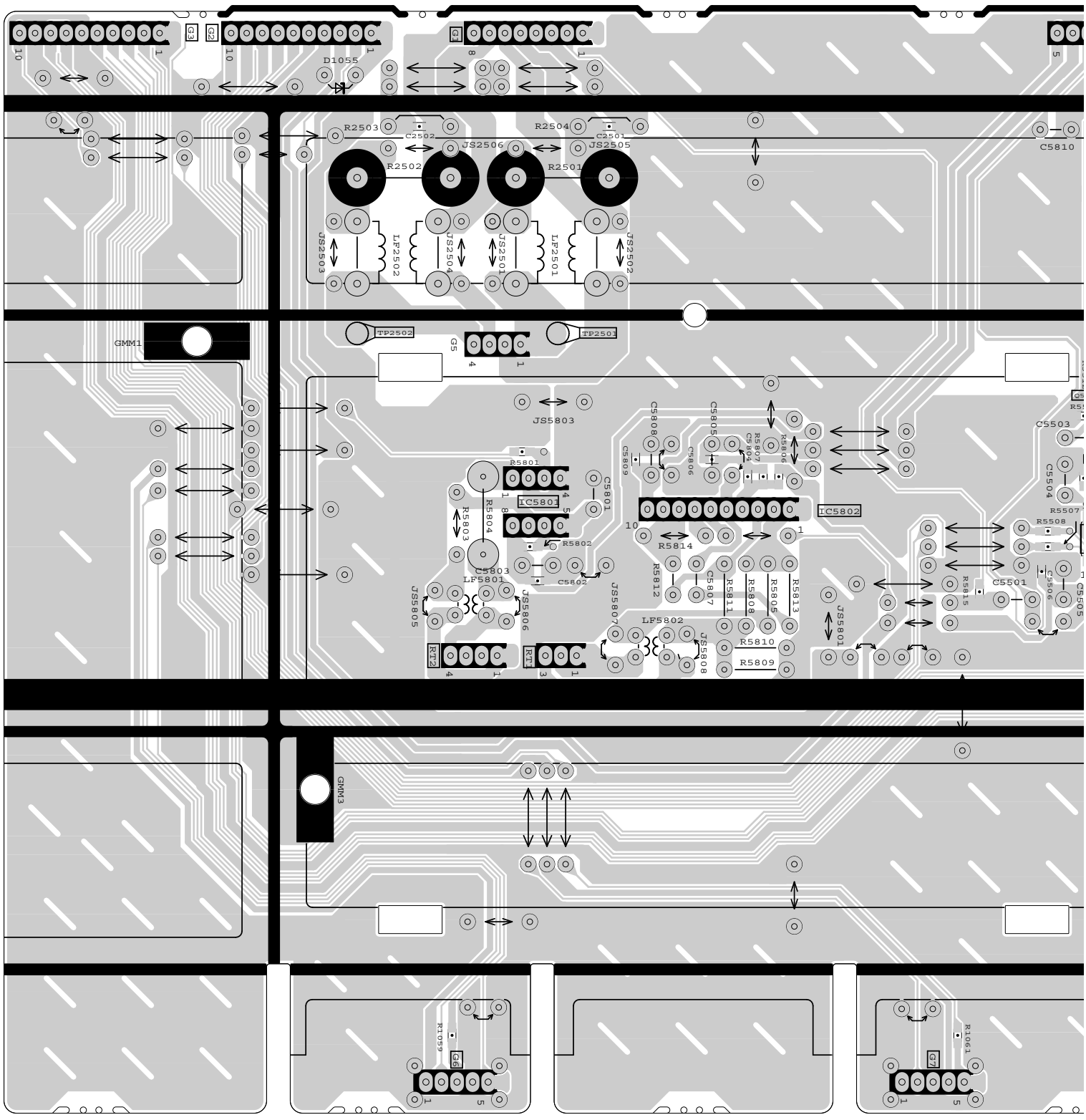
G3
G2
G1
D1055
R2503
C2502
R2504
C2501
JS2506
JS2505
C5810
R2502
R2501
JS2503
LF2502
JS2504
JS2501
LF2501
JS2502
GMM1
TP2502
TP2503
G5
JS5803
C5808
C5805
R5807
C5807
R5806
C5809
C5806
C5503
C5504
R5507
R5801
C5801
IC5801
R5804
R5803
R5802
C5803
C5802
LF5801
JS5805
JS5806
IC5802
R5814
R5812
C5807
R5811
R5808
R5805
R5813
JS5807
LF5802
JS5808
R5810
R5809
JS5801
R5508
R5515
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C5501
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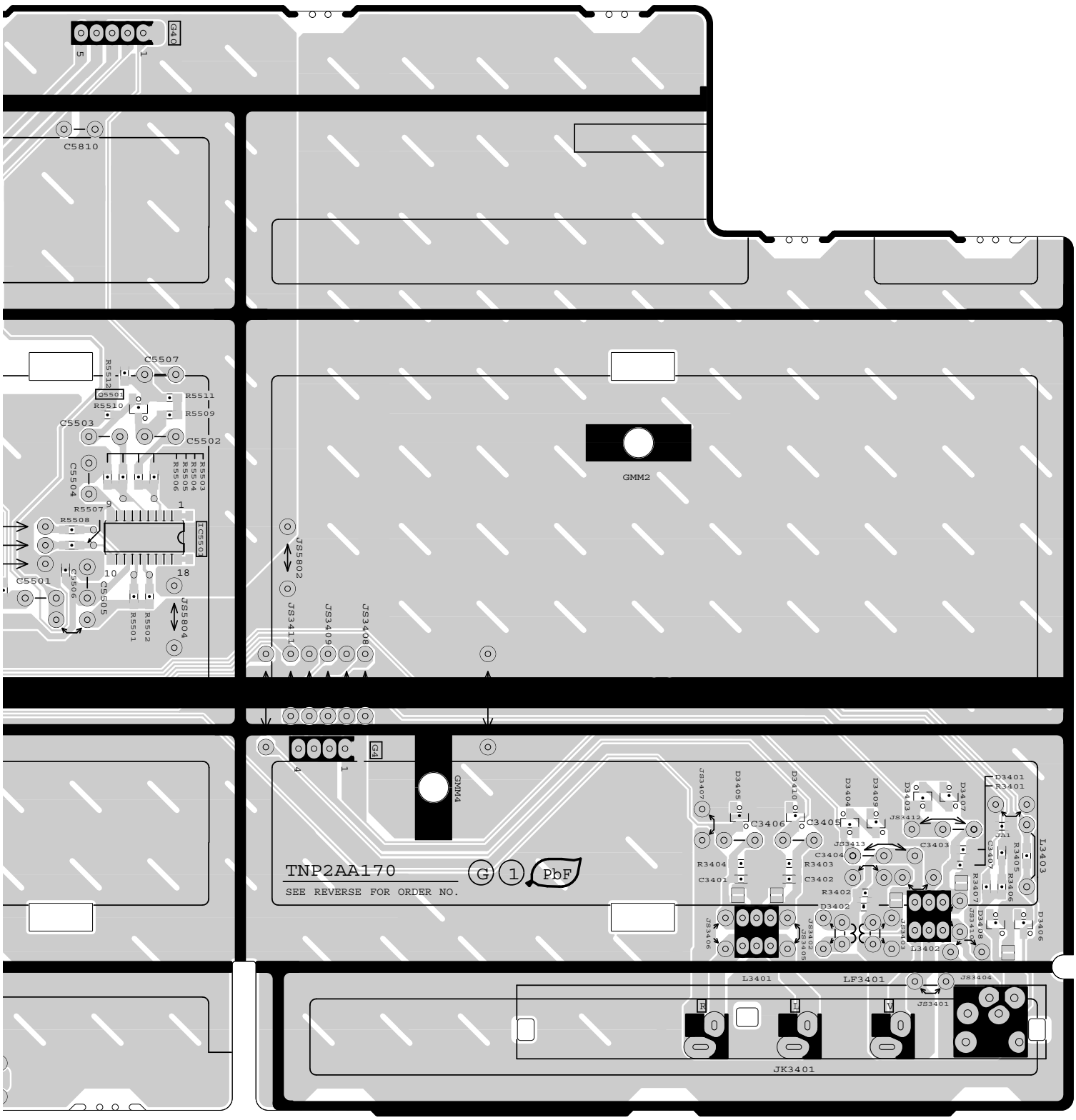
RT2
RT1
GMM3
R1059
G6
R1061
G7

1	2	3	4	5	6	7	8


G40
C5810
C5507
R5512
Q5502
R5511
R5510
R5509
C5503
C5502
C5504
R5503
R5504
R5505
R5506
R5507
R5508
IC5501
C5501
C5506
C5505
R5501
R5502
JS5804
JS5802
JS3411
JS3409
JS3408
GMM2
G4
GMM4
TNP2AA170
SEE REVERSE FOR ORDER NO.
G 1 PbF
D3401
R3401
C3406
C3405
C3404
C3403
C3402
R3404
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R3402
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D3402
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LF3401
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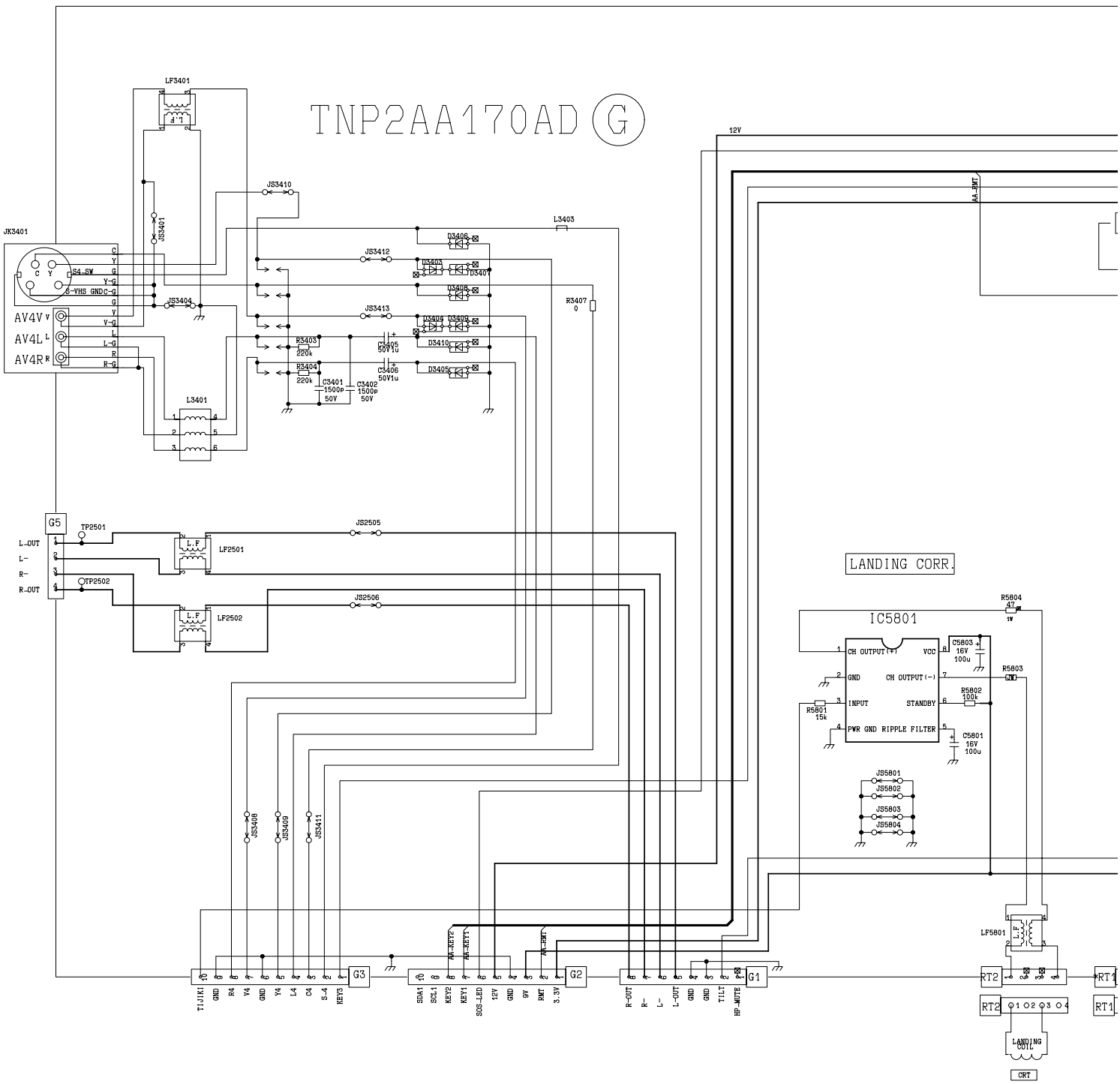
TNP2AA170AD G
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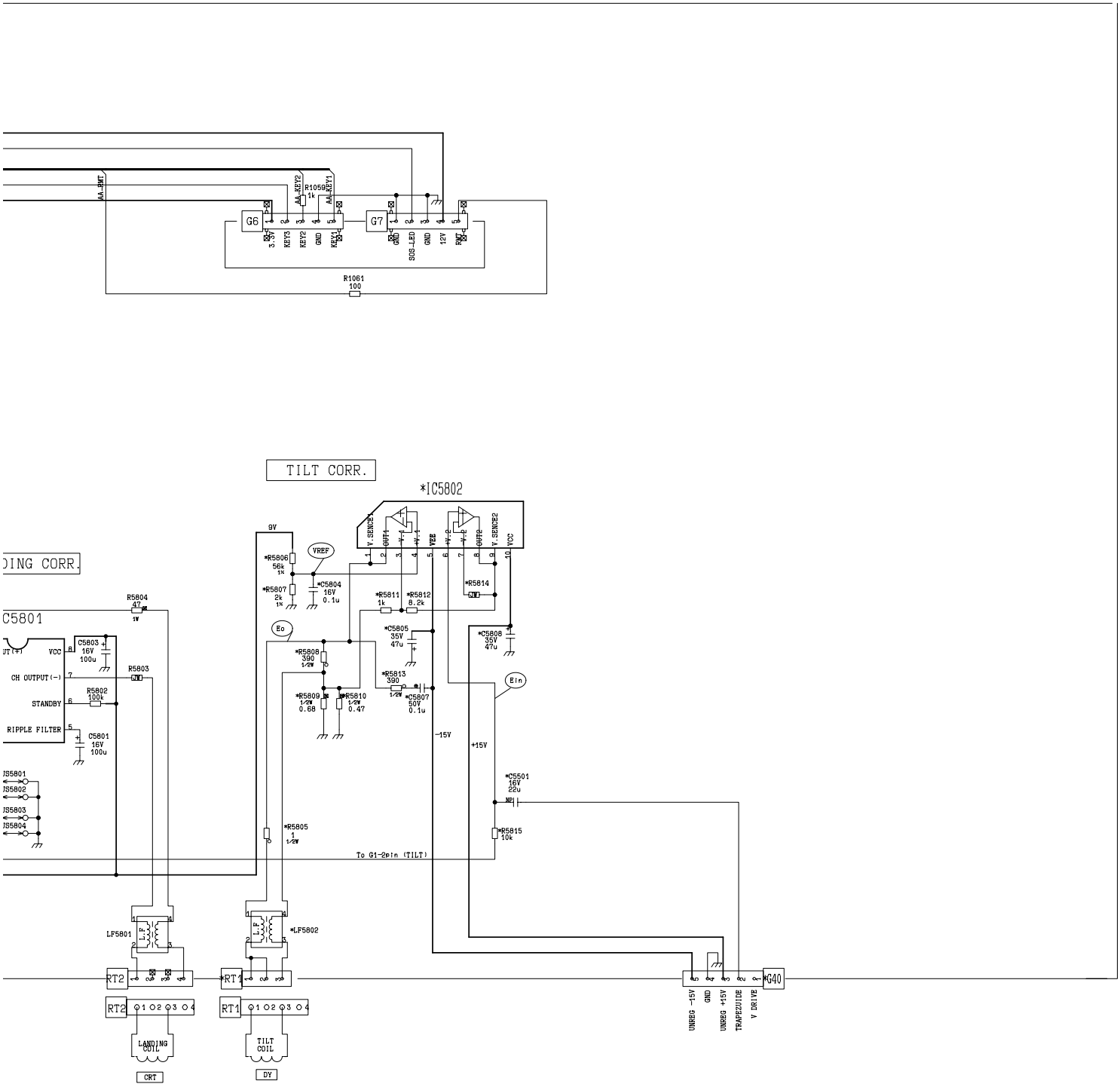
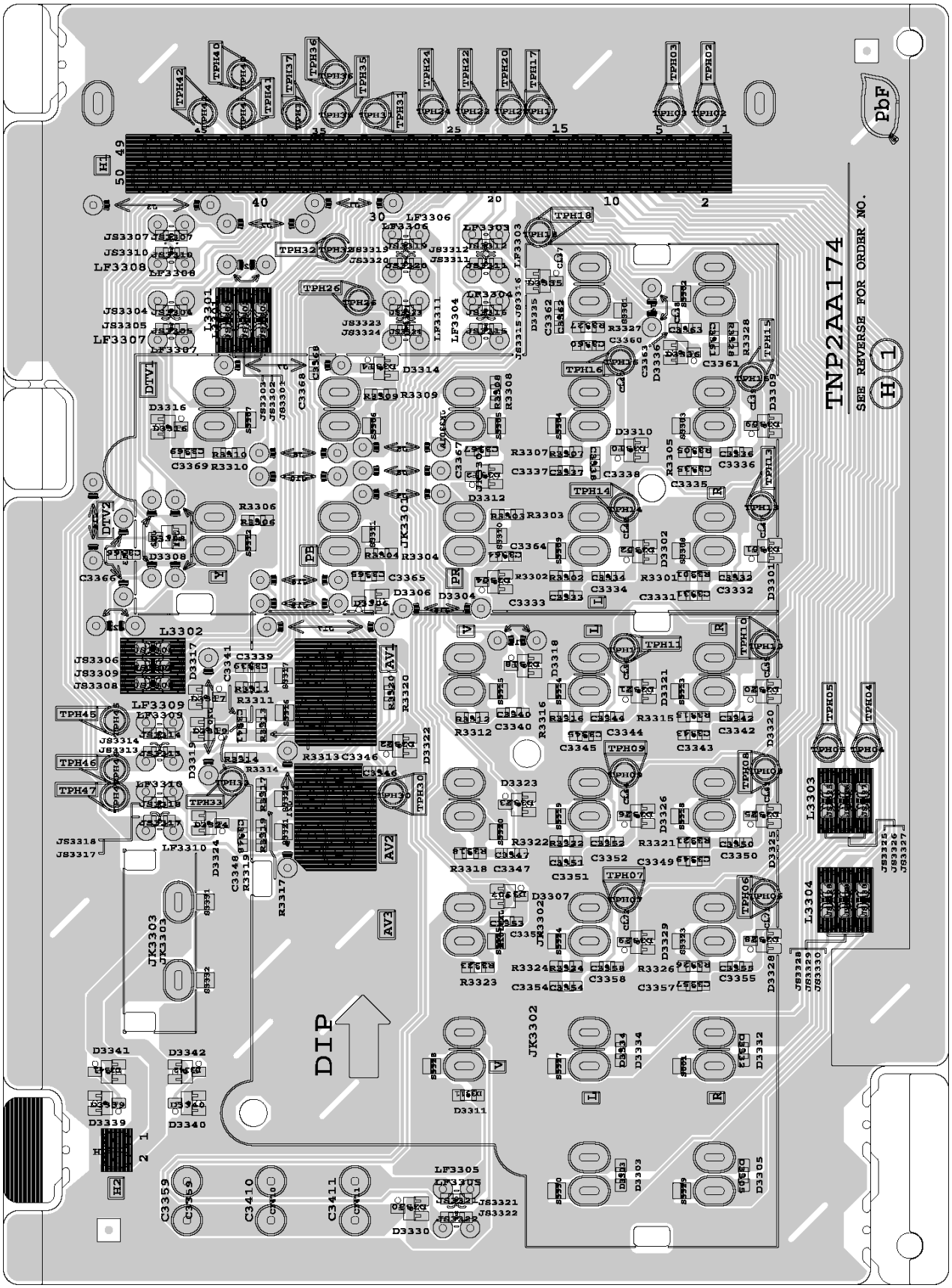
JS3410
JS3401
JK3401
S4-SW
S-VHS GND
AV4V
AV4L
AV4R
L3403
D3406
JS3412
D3407
D3408
JS3413
D3409
D3410
D3405
R3407
0
JS3404
R3403
220k
R3404
220k
C3401
1500p
50V
C3402
1500p
50V
C3405
50V1u
C3406
50V1u
L3401
G5
TP2501
TP2502
L_OUT
L-
R-
R_OUT
JS2505
JS2506
LF2501
LF2502
L.F
12V
AA-RMT
LANDING CORR.
IC5801
CH OUTPUT(+)
GND
INPUT
PWR GND
RIPPLE FILTER
VCC
CH OUTPUT(-)
STANDBY
R5804
47
1W
C5803
16V
100u
R5803
R5802
100k
R5801
15k
C5801
16V
100u
JS5801
JS5802
JS5803
JS5804
JS3408
JS3409
JS3411
LF5801
RT2
RT1
LANDING COIL
CRT
G3
G2
G1
TUNER
GND
R4
V4
GND
Y4
L4
C4
S-A
KEY3
SDA1
SCL1
KEY2
KEY1
SOS-LED
12V
GND
9V
RMT
3.3V
R-OUT
R-
L-
L-OUT
GND
GND
TILT
HP-MUTE

1	2	3	4	5	6	7	8


TILT CORR.
*IC5802
DING CORR.
C5801
9V
VREF
Eo
Ein
-15V
+15V
To G1-2pin (TILT)
LP5801
*LP5802
RT2
RT1
LANDING COIL
TILT COIL
CRT
DY
G6
G7
R1061 100
R1059 1k
UNREG -15V
GND
UNREG +15V
TRAPEZOIDE
V DRIVE
*G40



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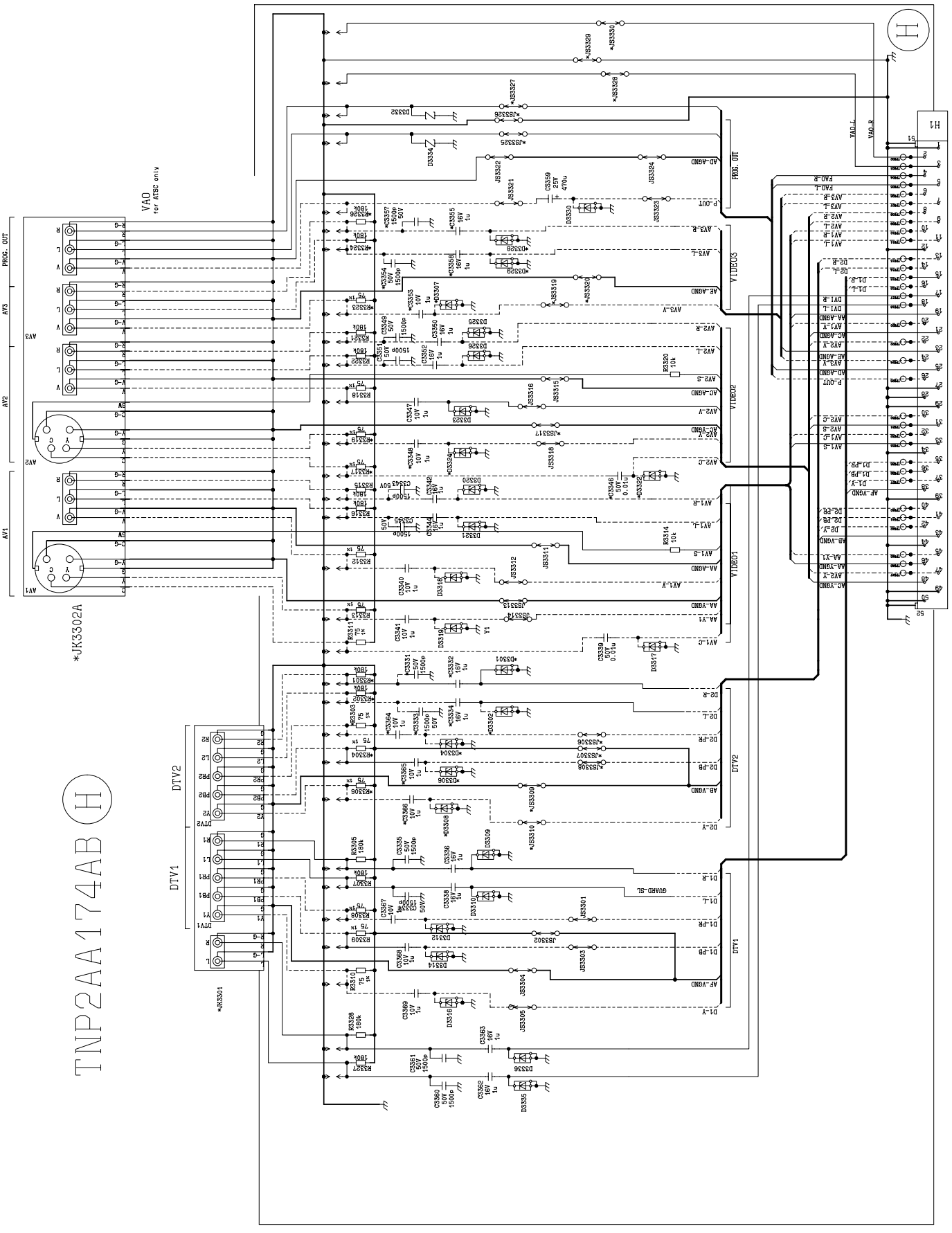
H-BOARD TNP2AA174 CT-32HL44J/UJ



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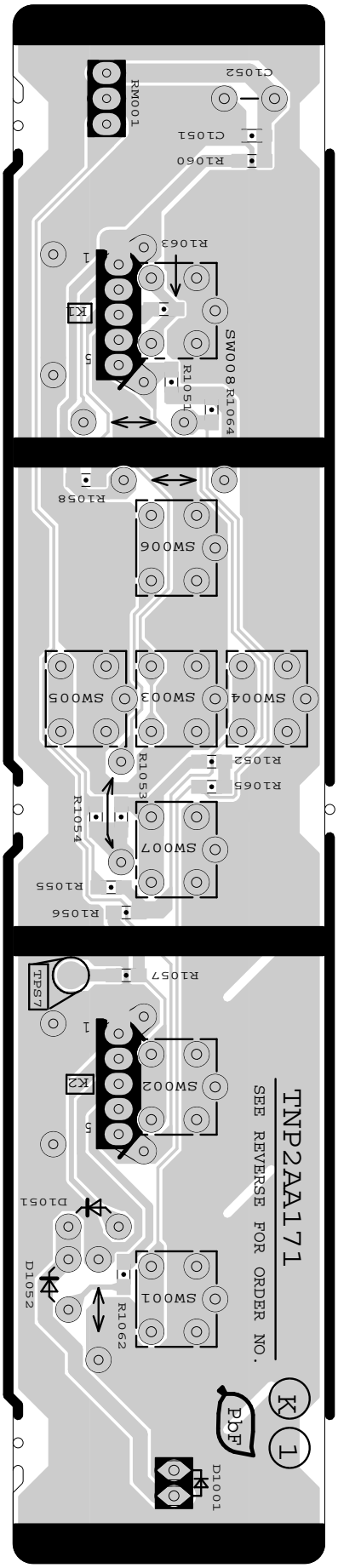
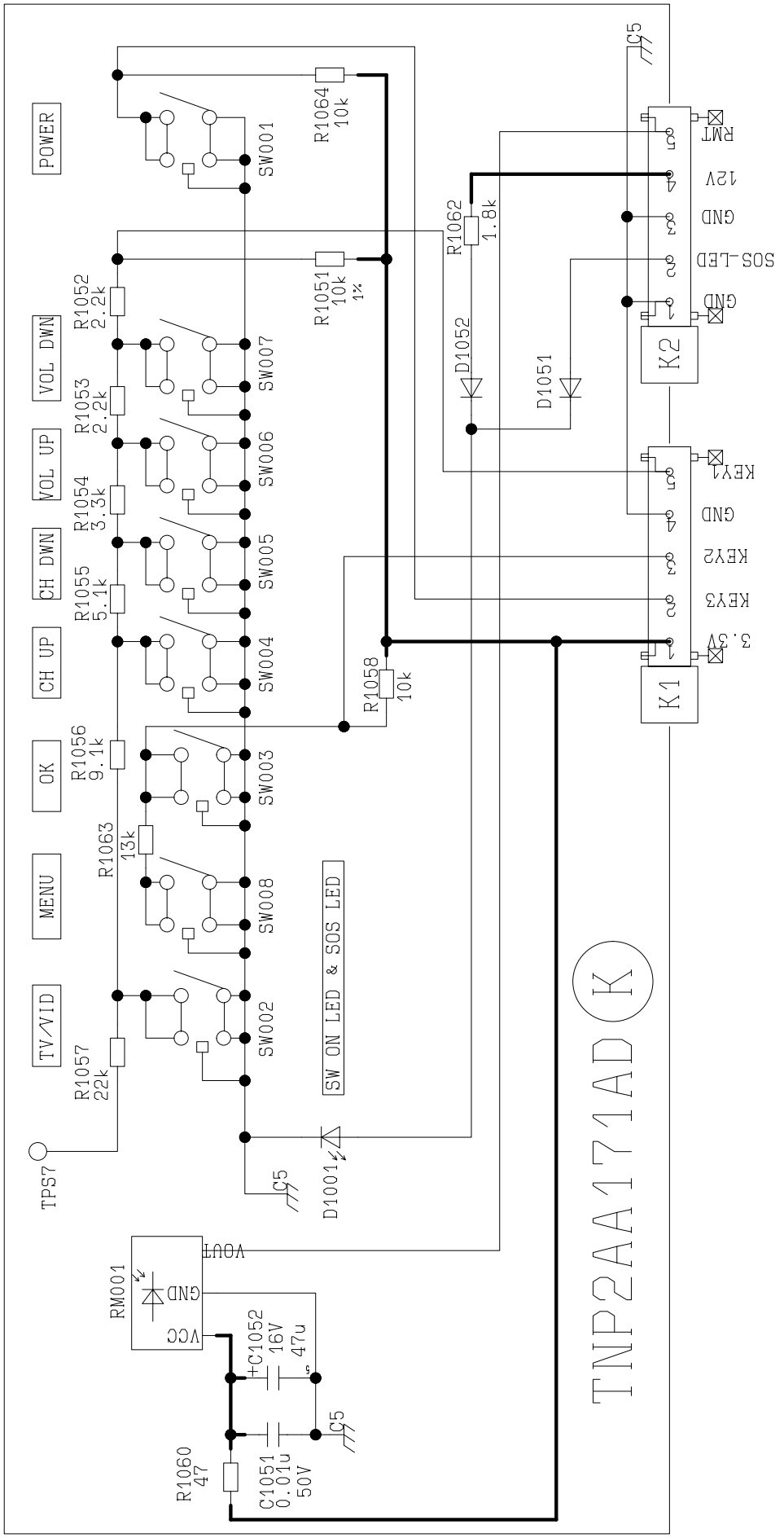


J I H G F E D C B A

1 2 3 4 5 6 7 8

K-BOARD TNP2AA171 CT-32HL44J/UJ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SW001
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10k
R1051
10k
1%
R1062
1.8k
D1052
D1051
VOL DWN
R1052
2.2k
SW007
VOL UP
R1053
2.2k
SW006
CH DWN
R1054
3.3k
SW005
CH UP
R1055
5.1k
SW004
R1058
10k
OK
R1056
9.1k
SW003
MENU
R1063
13k
SW008
TV/VID
R1057
22k
SW002
SW ON LED & SOS LED
D1001
TPS7
C5
RM001
VOUT
GND
VCC
+C1052
16V
47u
C1051
0.01u
50V
R1060
47
K2
K1
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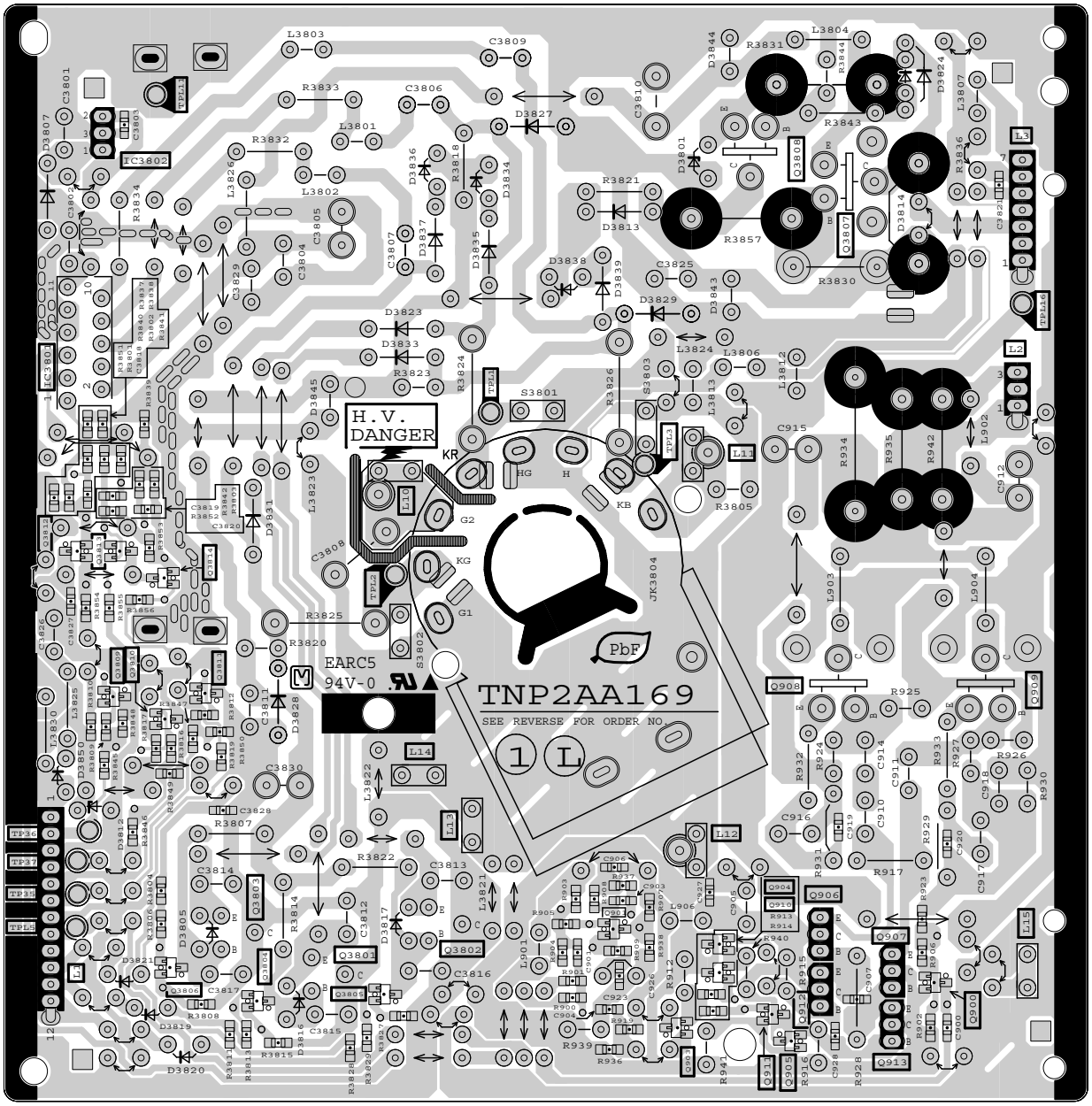
GND
SOS_LED
GND
KEY1
GND
KEY2
KEY3
3.3V
TNP2AA171AD (K)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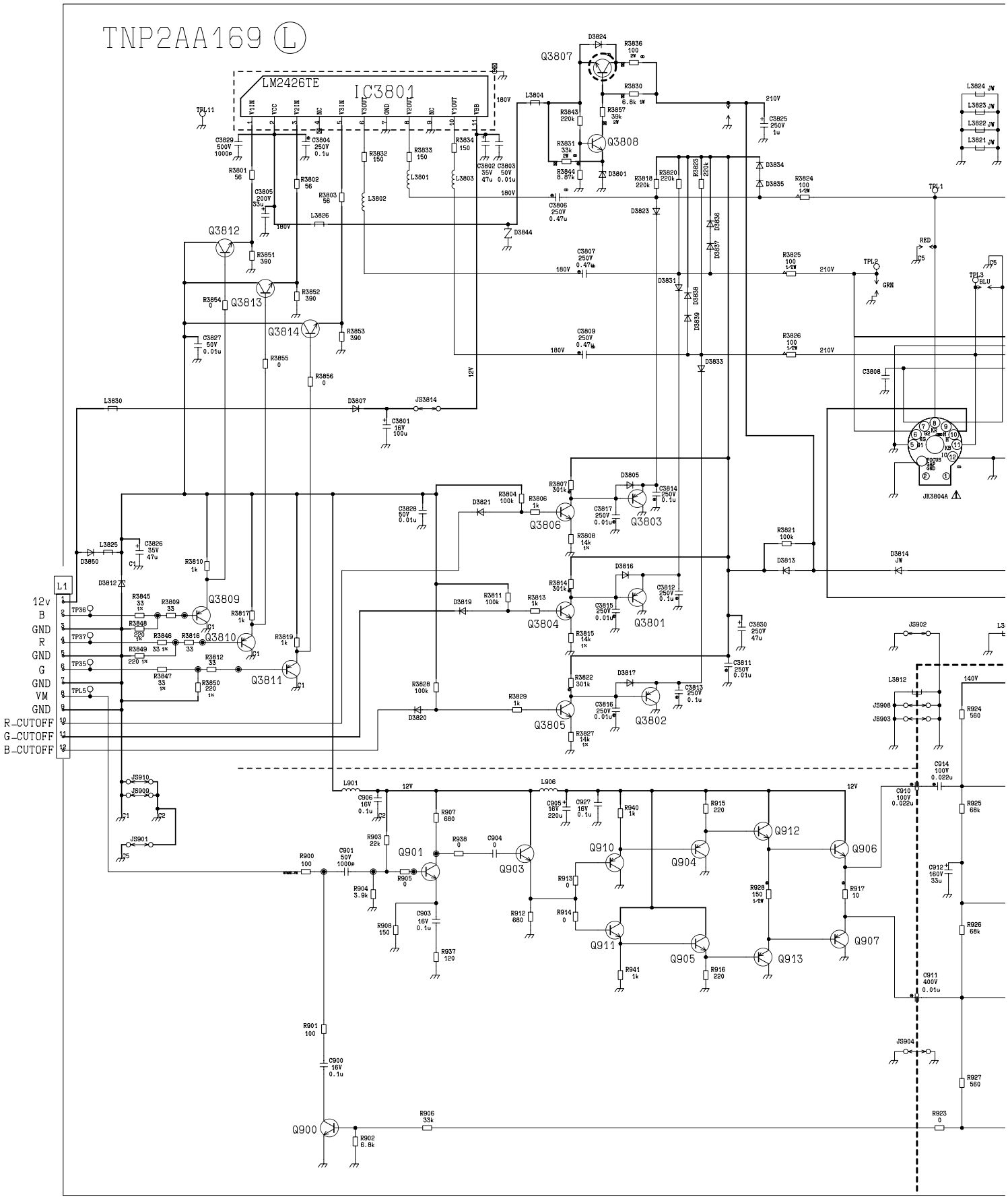
DANGER
EARC5
94V-0
TNP2AA169
SEE REVERSE FOR ORDER NO.
PbF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Q3801
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Q3809
Q3810
Q3811
Q901
Q903
Q910
Q904
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Q906
Q911
Q905
Q913
Q907
Q900
12v
B
GND
R
GND
G
GND
VM
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G_CUTOFF
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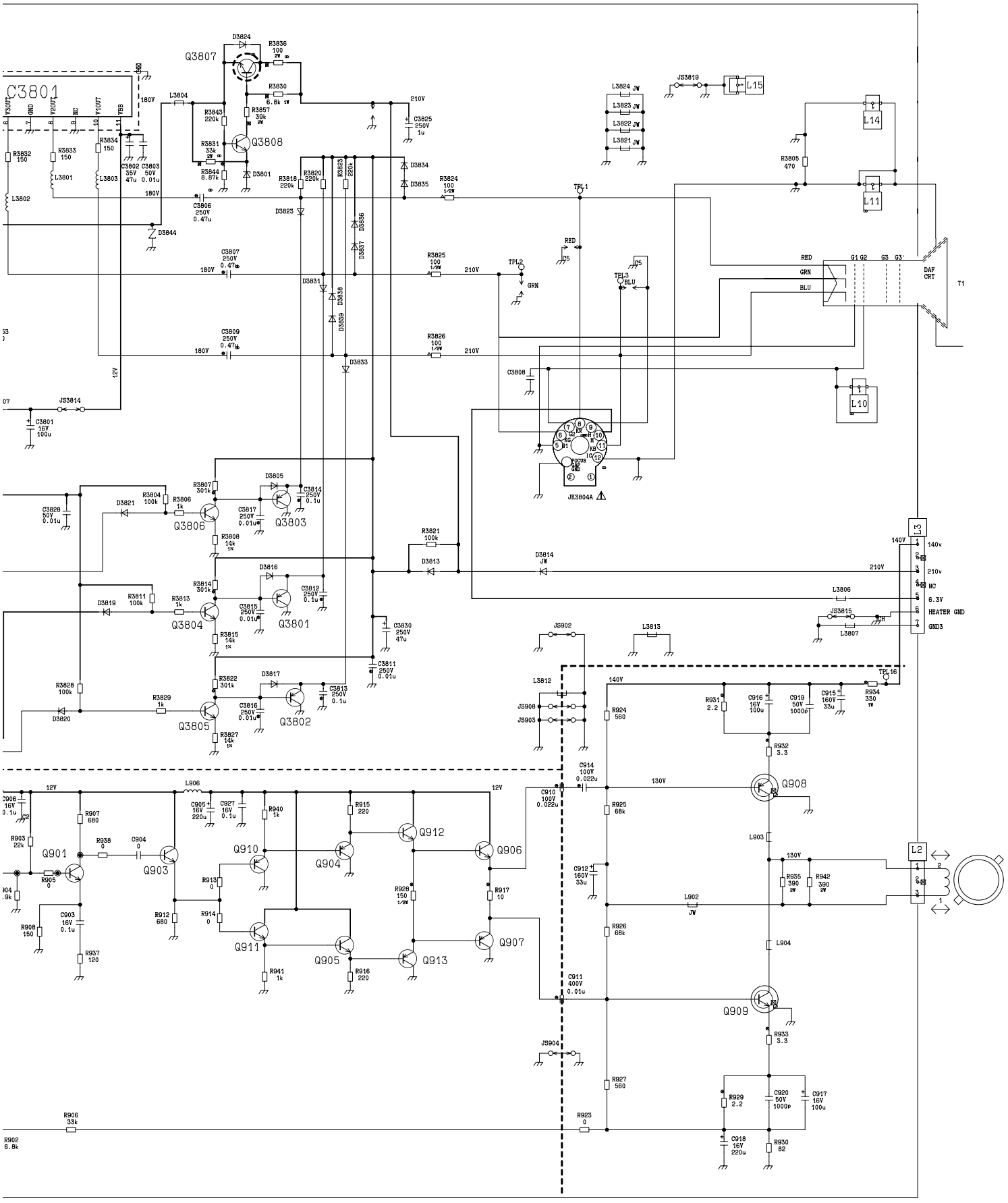
140V
12V
RED
GRN
BLU
JK3804A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TP1.2
TP1.3
TP1.6
JK3804A
DAF CRT
RED
GRN
BLU
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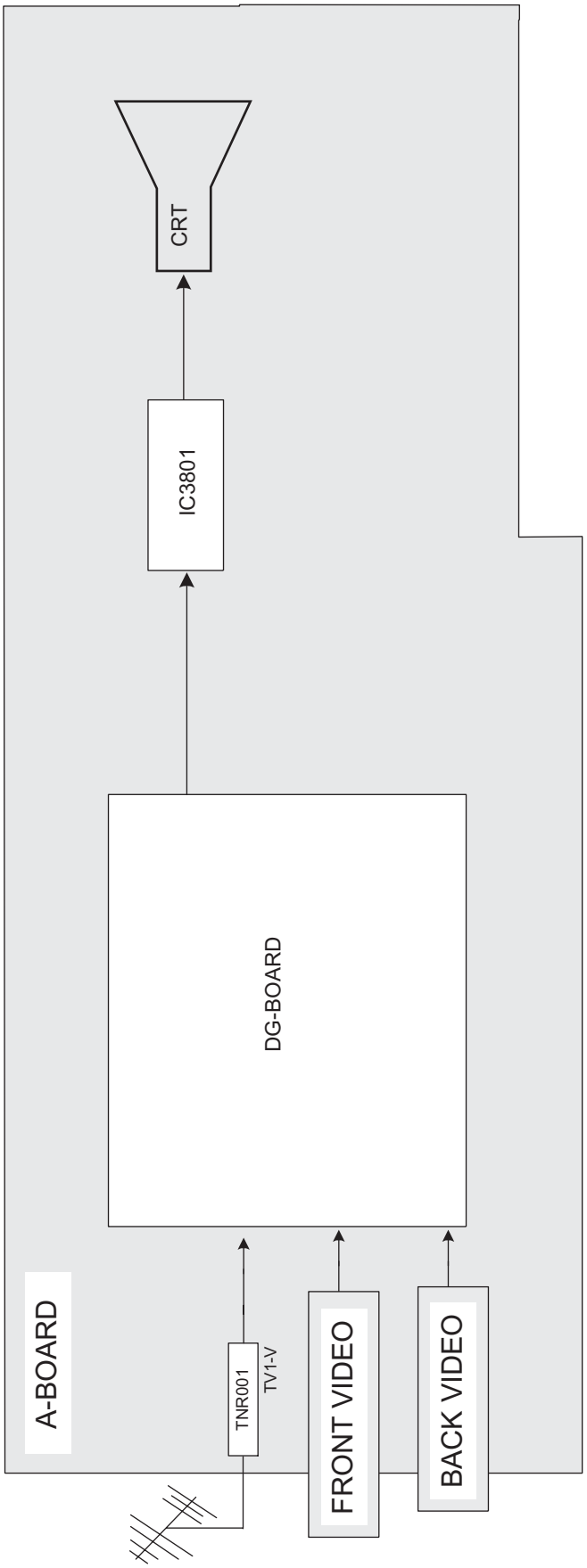
NC
6.3V
HEATER GND
GND3

1	2	3	4	5	6	7	8



VIDEO BLOCK DIAGRAM CT-32HL44J/UJ

A-BOARD - TNP2AH061AD

IC1501	
1	5.39
2	1.56
3	1.47
4	0.00
5	6.27
6	5.88
7	4.10
8	11.93

IC1502	
1	6.27
2	4.19
3	4.19
4	0.00
5	8.12
6	8.12
7	8.12
8	11.93

IC1503	
1	6.08
2	4.08
3	3.25
4	0.00
5	4.09
6	0.00
7	2.24
8	11.93

IC2856	
1	15.27
2	3.28
3	0.00
4	1.25
5	6.71

IC2857	
1	15.27
2	2.42
3	0.00
4	1.26
5	6.71

IC2201	
1	0.00
2	0.00
3	0.00
4	2.25
5	2.19
6	0.00
7	4.98
8	2.34
9	2.53
10	0.00
11	2.24
12	3.33
13	3.41
14	2.18
15	3.43
16	3.52
17	0.00
18	4.72
19	4.69
20	0.00
21	2.22
22	2.22
23	0.00
24	0.00

IC2301	
1	-16.73
2	-16.73
3	0.00
4	17.51
5	9.28
6	4.99
7	0.00
8	2.55
9	0.00
10	0.00
11	0.00
12	5.26
13	0.00
14	-15.51
15	0.00
16	-5.44
17	0.00
18	0.00
19	0.00
20	0.00
21	9.25
22	17.51
23	0.00
24	-16.73
25	-6.28

IC2451			
1	4.45	16	8.91
2	0.00	17	4.88
3	4.48	18	0.00
4	4.45	19	3.84
5	4.46	20	3.84
6	4.49	21	4.45
7	4.49	22	4.49
8	4.49	23	4.49
9	1.34	24	4.49
10	4.49	25	4.49
11	1.47	26	4.84
12	1.43	27	4.84
13	4.67	28	4.27
14	4.73	29	4.50
15	0.00	30	4.45

IC006	
1	4.94
2	4.94
3	4.20
4	3.18
5	5.16
6	2.42
7	2.91
8	0.00
9	0.00
10	8.00
11	8.88
12	0.00
13	8.90
14	4.70
15	4.74
16	8.88

IC1401	
1	0.00
2	2.13
3	1.27
4	0.00
5	0.50
6	1.27
7	0.00
8	8.91

IC2305	
1	7.76
2	0.00
3	0.00
4	0.00
5	4.49
6	4.44
7	4.44
8	8.91

IC002	
1	0.00
2	0.00
3	0.00
4	0.00
5	3.28
6	3.29
7	0.00
8	3.28

IC2851	
1	14.87
2	11.94
3	0.00
4	9.62

A-BOARD - TNP2AH061AD

	Q002	Q013	Q804	Q1401	Q1501	Q1502
B	2.97	2.25	4.27	0.00	6.06	6.06
E	0.00	7.35	0.50	8.91	11.93	0.00
C	0.00	4.94	0.00	0.00	6.13	6.12

	Q1504	Q1505	Q1511	Q1512	Q2301	Q2302
B	0.00	9.15	5.39	5.40	0.00	0.00
E	5.87	5.87	11.31	0.00	0.00	15.26
C	0.00	9.76	5.22	5.22	0.00	0.00

	Q2303	Q2304	Q2306	Q2307	Q2310	Q2314
B	0.00	0.00	15.26	0.00	15.26	0.00
E	0.00	0.00	0.00	0.00	0.00	15.26
C	0.00	0.00	10.47	0.00	10.47	0.00

	Q2317	Q2318	Q2881
B	0.00	0.00	3.27
E	0.00	0.00	0.00
C	0.00	0.00	3.28

D-BOARD - TNP2AH062AD

IC507	
1	0.00
2	0.00
3	0.00
4	0.00
5	3.18
6	3.05
7	3.62
8	11.93

IC805	
1	34.00
2	7.31
3	0.00
4	1.25
5	4.46

IC500	
1	99.40
2	99.40
3	99.40
4	102.50
5	91.40
6	98.70
7	98.70
8	103.90
9	99.80
10	104.90

IC501	
R	0.00
A	0.00
K	11.92

IC451	
1	-16.03
2	-16.04
3	-16.03
4	0.72
5	15.90
6	-14.50
7	9.98
8	-5.62
9	0.00
10	-12.44
11	0.00
12	0.98
13	0.99
14	0.00
15	14.98
16	14.98
17	-16.03
18	-16.04
19	-16.04
20	-16.03

IC502	
1	2.52
2	11.87
3	1.99
4	1.31
5	4.05
6	0.00
7	0.00
8	0.00
9	0.00
10	11.87
11	7.34
12	7.34
13	2.71
14	0.00
15	0.00
16	0.00

IC802	
1	131.00
2	11.98
3	0.00

D-BOARD - TNP2AH062AD

	Q404	Q405	Q406	Q459	Q511	Q512	Q513	Q514
B	0.65	0.00	0.66	3.61	6.76	7.30	0.68	0.71
E	0.00	11.05	0.00	78.40	0.00	11.91	0.00	0.00
C	0.00	0.00	0.00	3.05	7.34	6.76	0.00	0.00

	Q515	Q516	Q551	Q702	Q703	Q704	Q820	Q821
B	11.10	0.70	0.00	0.54	2.06	2.06	-15.39	14.76
E	11.87	0.00	-0.98	2.07	11.93	0.00	-16.06	15.35
C	11.91	0.00	0.00	0.00	2.13	2.13	-16.10	15.44

	Q822	Q823	Q824	Q825	Q826	Q827	Q831
B	14.02	0.70	14.66	0.00	0.70	139.10	15.03
E	14.63	0.00	15.37	1.15	0.00	0.00	0.00
C	14.82	0.00	15.43	0.00	0.00	139.50	15.35

	Q501	Q560	Q701
G	5.22	207.50	2.13
D	8.77	98.80	24.15
S	0.00	210.40	0.00

L-BOARD - TNP2AA169

IC3801	
1	2.35
2	178.70
3	2.25
4	0.00
5	2.31
6	126.00
7	0.00
8	129.10
9	0.00
10	125.00
11	11.15

L-BOARD - TNP2AA169

	Q3806	Q3804	Q3805	Q3802	Q901	Q903	Q904
B	2.50	2.22	2.08	174.70	1.59	6.77	6.74
E	166.80	172.90	0.00	0.00	0.00	11.01	0.00
C	1.96	1.68	1.55	180.20	0.94	6.11	7.38

	Q910	Q911	Q905	Q912	Q906	Q907	Q913
B	6.11	6.12	5.49	7.38	6.75	5.53	4.86
E	0.00	0.00	10.92	10.92	10.92	0.00	0.00
C	6.74	5.49	4.85	6.74	6.16	6.12	5.53

	Q900	Q909	Q908	Q3808	Q3809	Q3810	Q3811
B	0.00	0.99	137.10	6.73	2.34	2.24	2.29
E	0.00	63.00	62.60	9.40	0.00	0.00	0.00
C	0.00	0.50	137.70	6.12	3.00	2.89	2.95

	Q3814	Q3813	Q3812	Q3807
B	2.95	2.89	2.99	179.20
E	11.05	0.00	11.05	207.50
C	2.32	2.27	0.00	178.70

G-BOARD - TNP2AA170AD

IC5801	
1	4.10
2	0.00
3	2.40
4	0.00
5	4.11
6	7.94
7	4.00
8	8.91

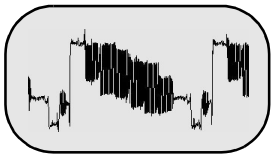
IC5802	
1	-1.47
2	-1.47
3	0.00
4	0.00
5	-16.13
6	2.91
7	2.91
8	2.91
9	2.91
10	15.43

DF-BOARD - TNP2AA172AB

	Q563	Q564	Q566	Q565
B	1.27	0.81	0.50	2.82
E	147.40	0.73	2.86	11.49
C	0.99	0.00	0.00	3.08

	Q562	Q561
G	8.00	3.07
D	47.57	102.00
S	0.00	0.00

A-Board TNP2AH061AD



① **1.0 Vp-p**
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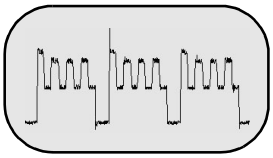
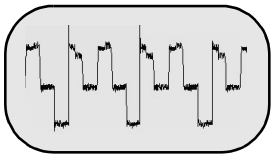
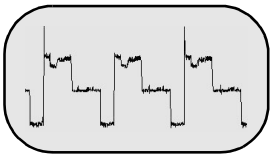


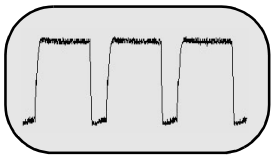
② **3.08 Vp-p**
L1 PIN 2 (BLUE OUT)



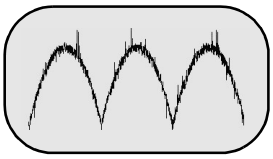
③ **2.68 Vp-p**
L1 PIN 4 (RED OUT)



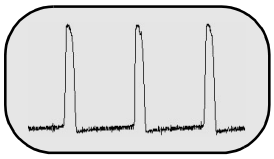
④ **2.76 Vp-p**
L1 PIN 6 (GREEN OUT)



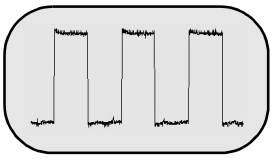
⑤ **3.20 Vp-p**
A8 PIN 1



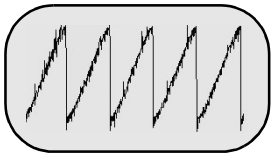
⑥ **0.88 Vp-p**
A8 PIN 3 (V-DAF)



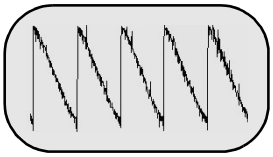
⑦ **3.12 Vp-p**
A8 PIN 13 (FBP)



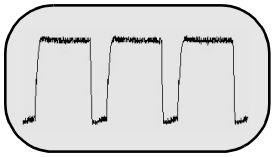
⑧ **11.3 Vp-p**
A8 PIN 16 (H DRIVE)



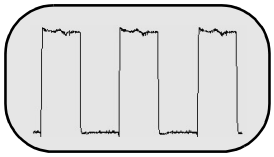
⑨ **1.74 Vp-p**
A7 PIN 4 (V_DRIVE)



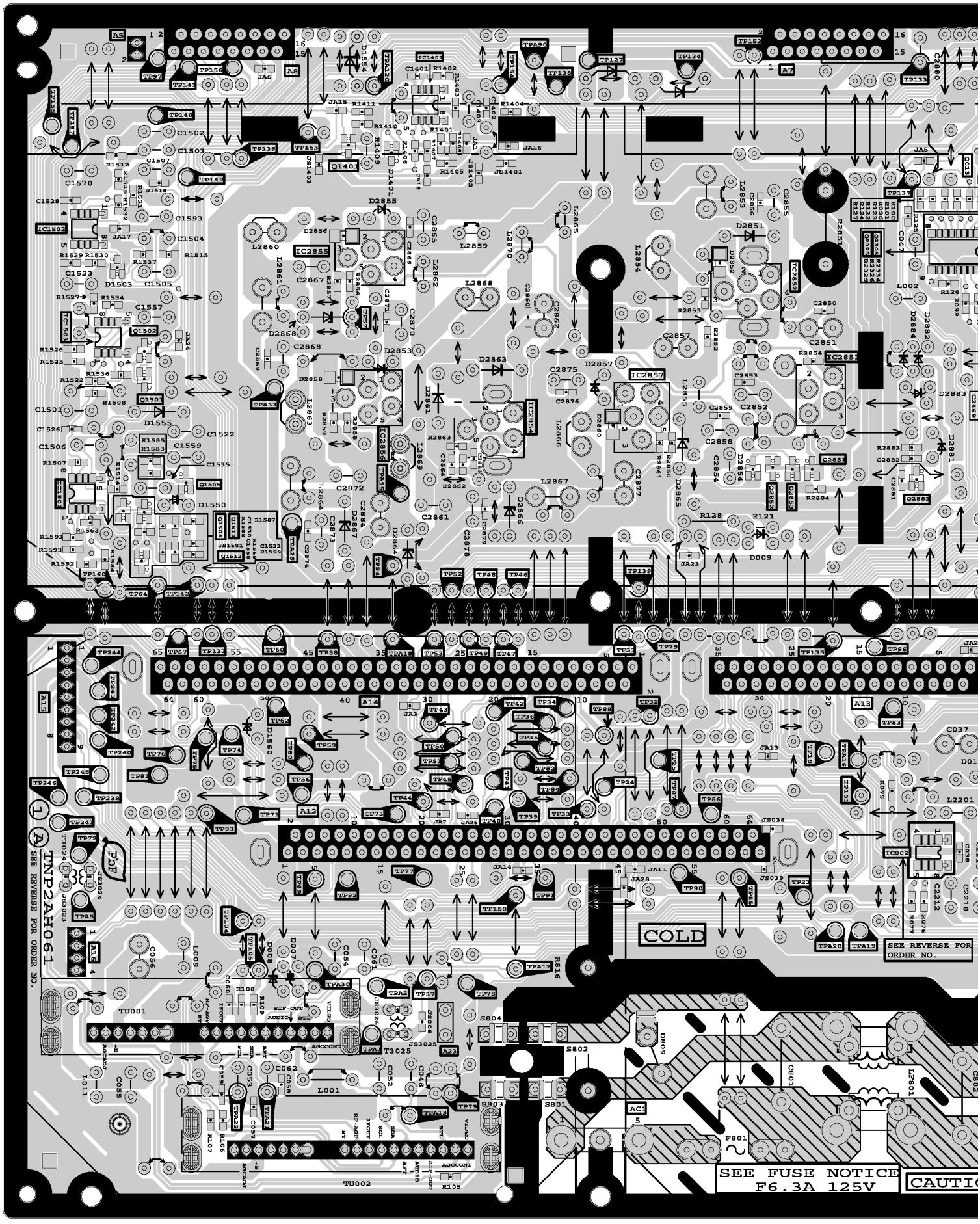
⑩ **1.98 Vp-p**
A7 PIN 7 (V_DRIVE)



⑪ **3.28 Vp-p**
A7 PIN 9



⑫ **11.4 Vp-p**
A6 PIN 4


TNP2AH061
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COLD
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SEE FUSE NOTICE
F6.3A 125V
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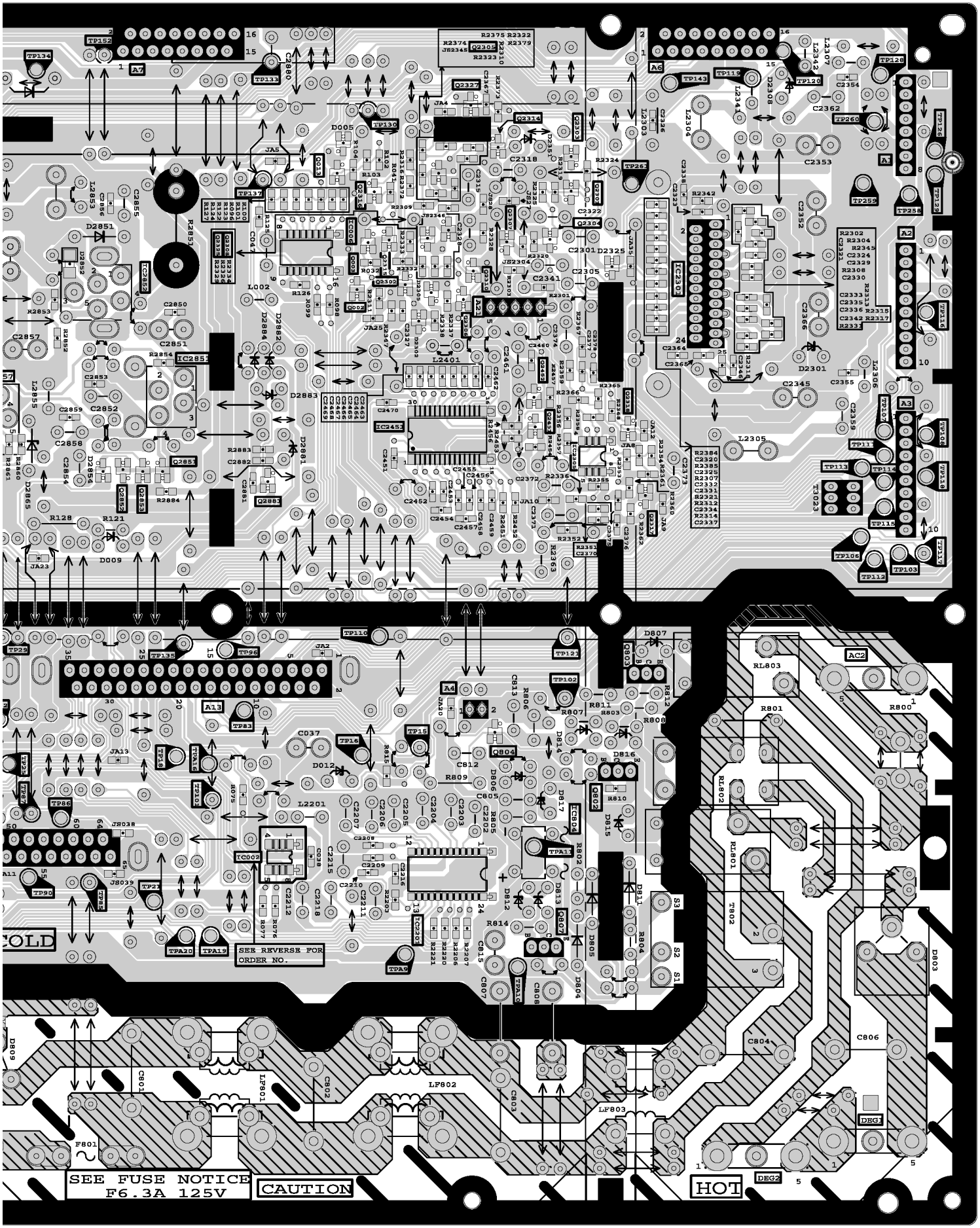
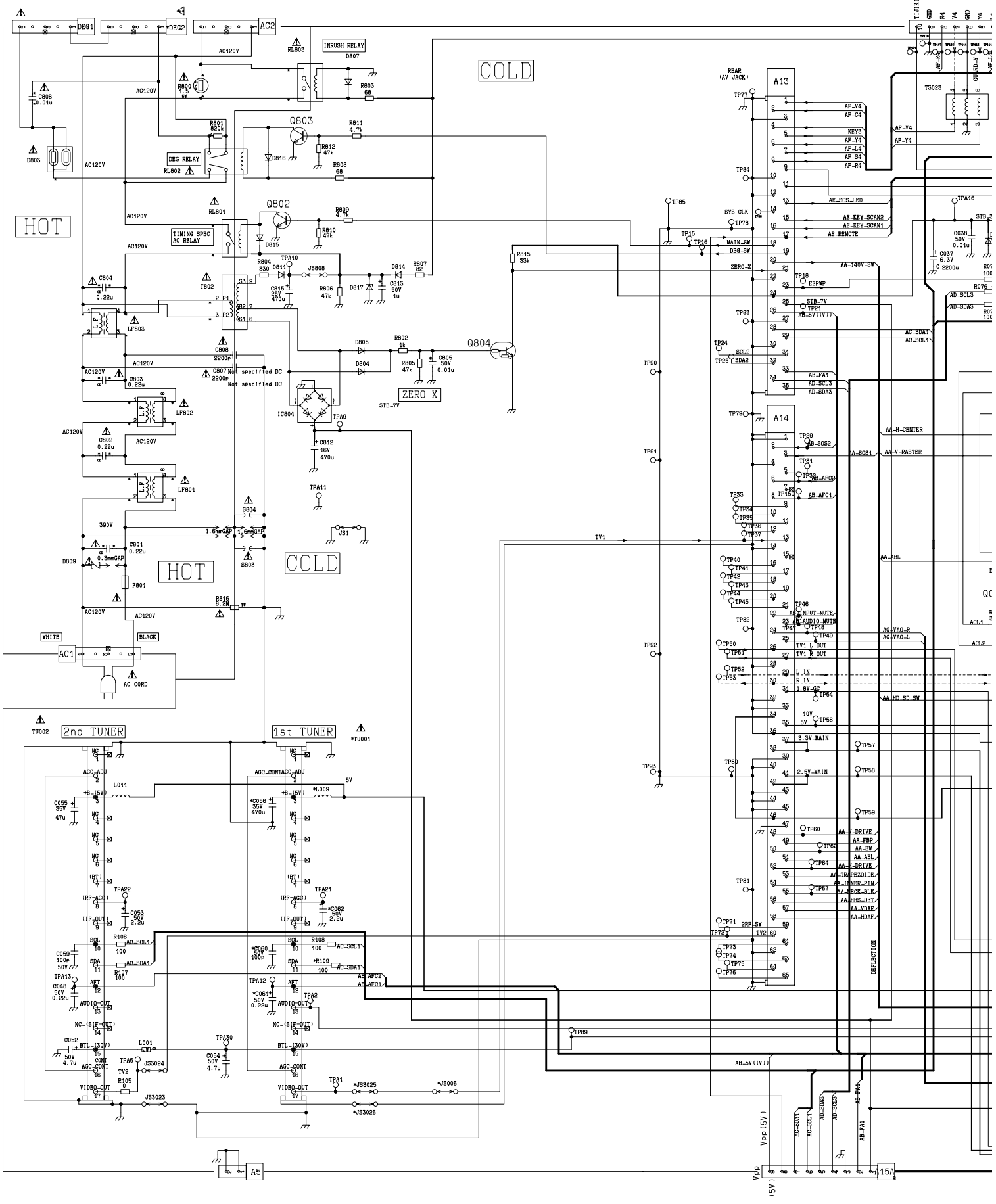
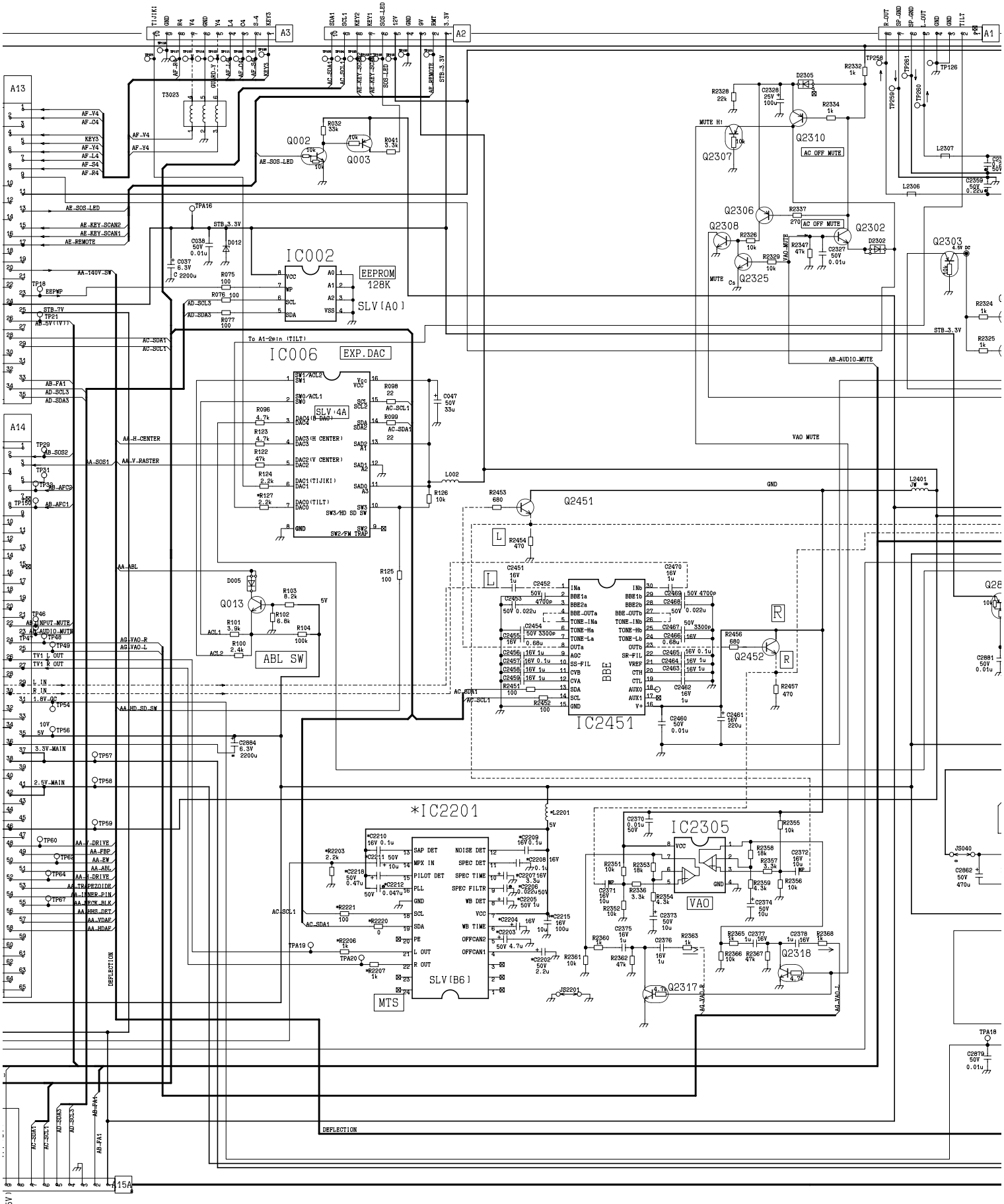
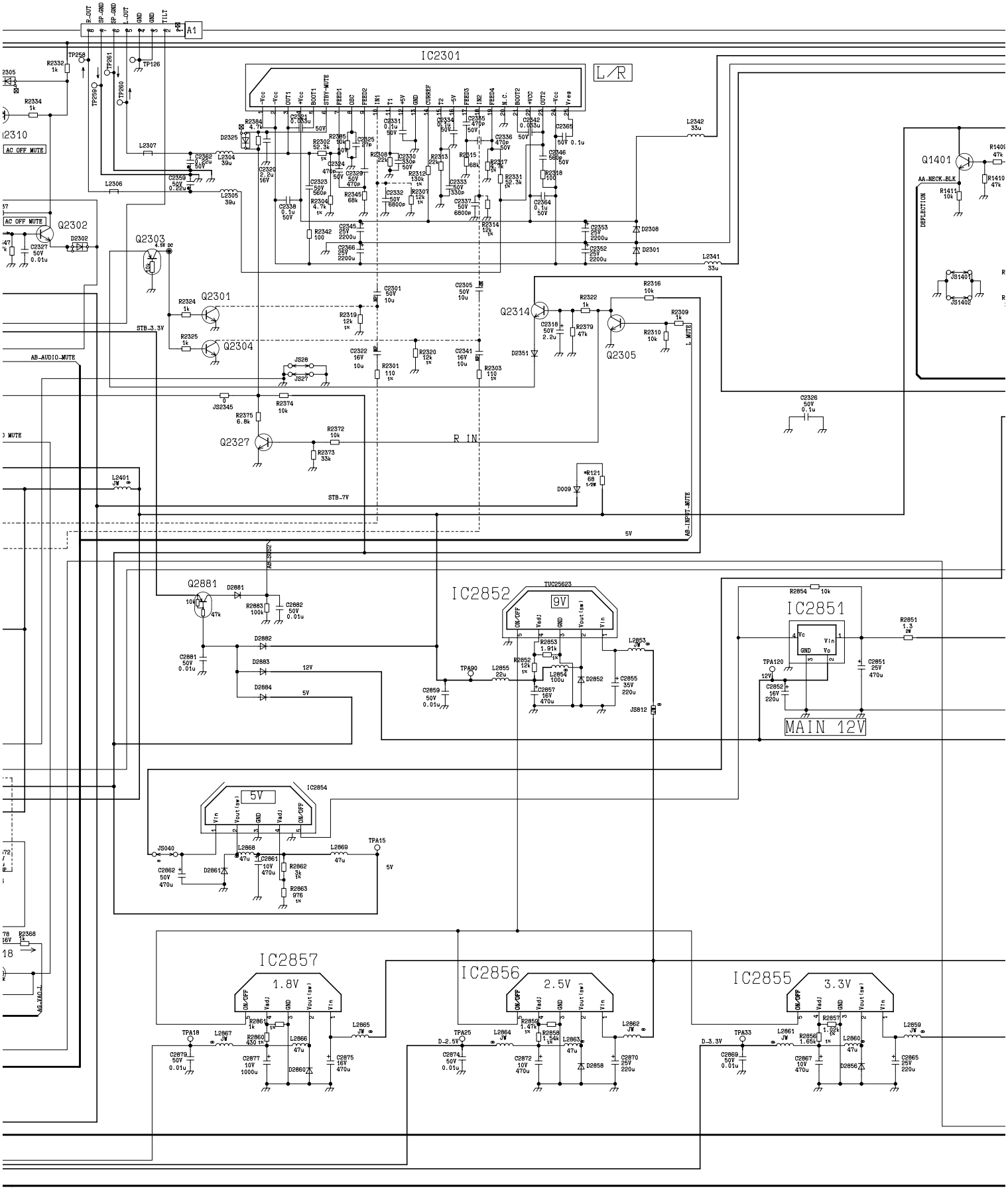
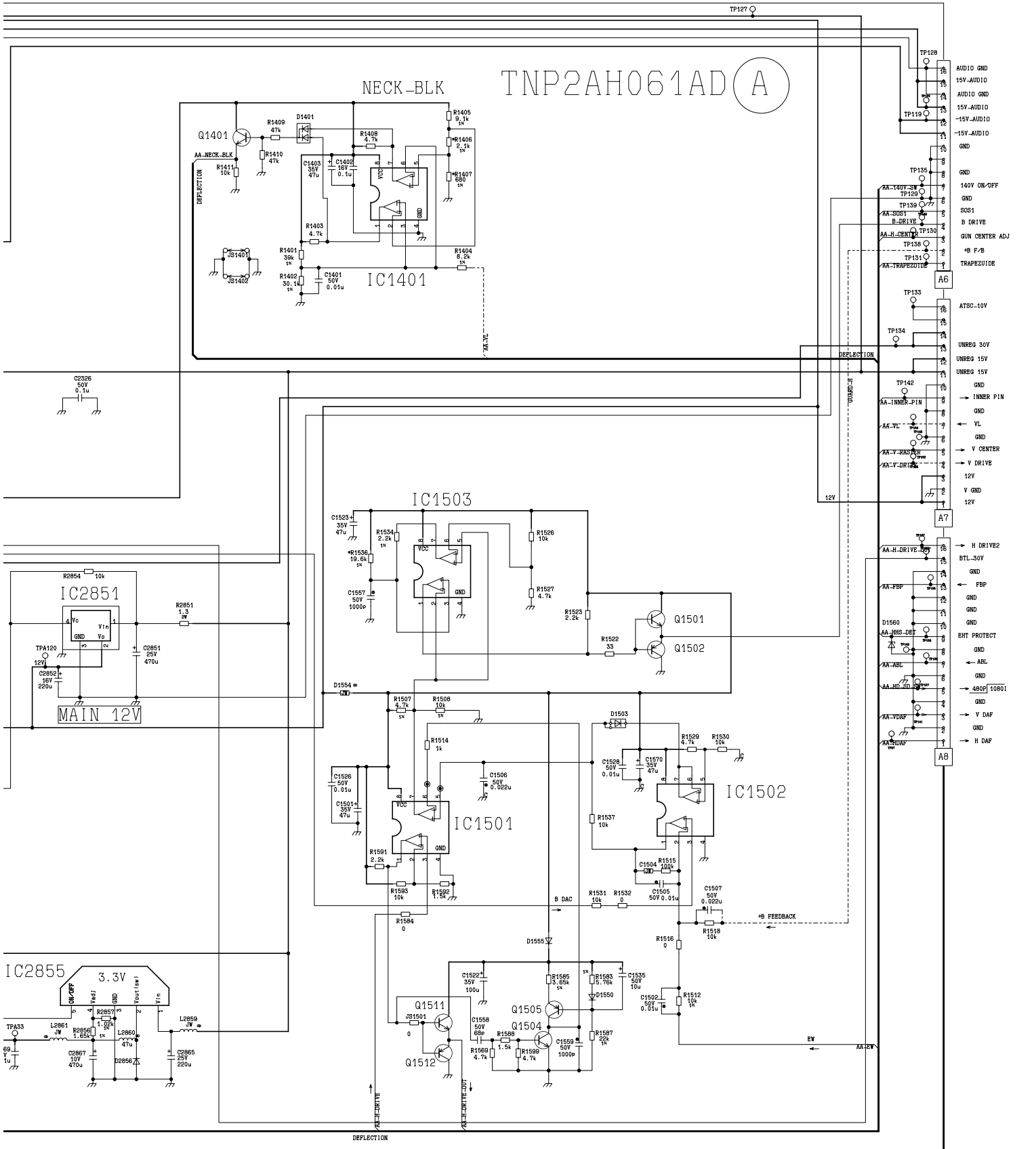

SEE FUSE NOTICE
F6.3A 125V
CAUTION
HOT
SEE REVERSE FOR ORDER NO.
COLD


COLD
HOT
INRUSH RELAY
DEG RELAY
TIMING SPEC AC RELAY
ZERO X
2nd TUNER
1st TUNER
AC CORD
WHITE
BLACK
REAR (AV JACK)
A13
A14
A15A
A5
DEFLECTION


IC002
EEPROM 128K
SLV[A0]
IC006
EXP.DAC
SLV:4A
ABL SW
IC2451
*IC2201
SLV[B6]
MTS
IC2305
VAO
Q2310
AC OFF MUTE
Q2306
Q2308
Q2302
Q2325
Q2307
Q2303
Q2451
Q2452
Q2317
Q2318
Q002
Q003
Q013
D2305
D2302
D012
D005
L002
L2306
L2307
L2401
A13
A14
A15A
A1
A2
A3
DEFLECTION
VAO MUTE
AB-AUDIO-MUTE
STB-3.3V
MUTE H:
MUTE L
GND


IC2301
L/R
IC2852
TUC25623
9V
IC2851
MAIN 12V
IC2854
5V
IC2857
1.8V
IC2856
2.5V
IC2855
3.3V
Q2301
Q2302
Q2303
Q2304
Q2305
Q2314
Q2327
Q2881
Q1401
AC OFF MUTE
AB-AUDIO-MUTE
STB-3.3V
STB-7V
R IN
L MUTE
AB-INPUT-MUTE
DEFLECTION
AA-NECK-BLK
12V
5V
D-2.5V
D-3.3V


TNP2AH061AD A
NECK_BLK
IC1401
IC1503
IC1501
IC1502
IC2851
IC2855
MAIN 12V
3.3V
Q1401
Q1501
Q1502
Q1504
Q1505
Q1511
Q1512
D1401
D1503
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AUDIO GND
15V_AUDIO
AUDIO GND
15V_AUDIO
-15V_AUDIO
-15V_AUDIO
GND
GND
140V ON/OFF
GND
SOS1
B DRIVE
GUN CENTER ADJ
+B F/B
TRAPEZUIDE
ATSC_10V
UNREG 30V
UNREG 15V
UNREG 15V
GND
INNER PIN
GND
VL
GND
V CENTER
V DRIVE
12V
V GND
12V
H DRIVE2
BTL_30V
GND
FBP
GND
GND
GND
EHT PROTECT
GND
ABL
GND
480P 1080I
GND
V DAF
GND
H DAF
A6
A7
A8
AA_NECK_BLK
AA_VL
AA_140V_ON
AA_SOS1
AA_H_CENTER
AA_TRAPEZUIDE
AA_INNER_PIN
AA_V_RAMP
AA_V_DRIVE
AA_H_DRIVE_OUT
AA_FBP
AA_HHS_DET
AA_ABL
AA_HD_SD
AA_VDAF
AA_HDAF
DEFLECTION
GUARD_H
12V
B DAC
+B FEEDBACK
EW
AA_EW
AA_H_DRIVE
AA_H_DRIVE_OUT
MAIN 12V

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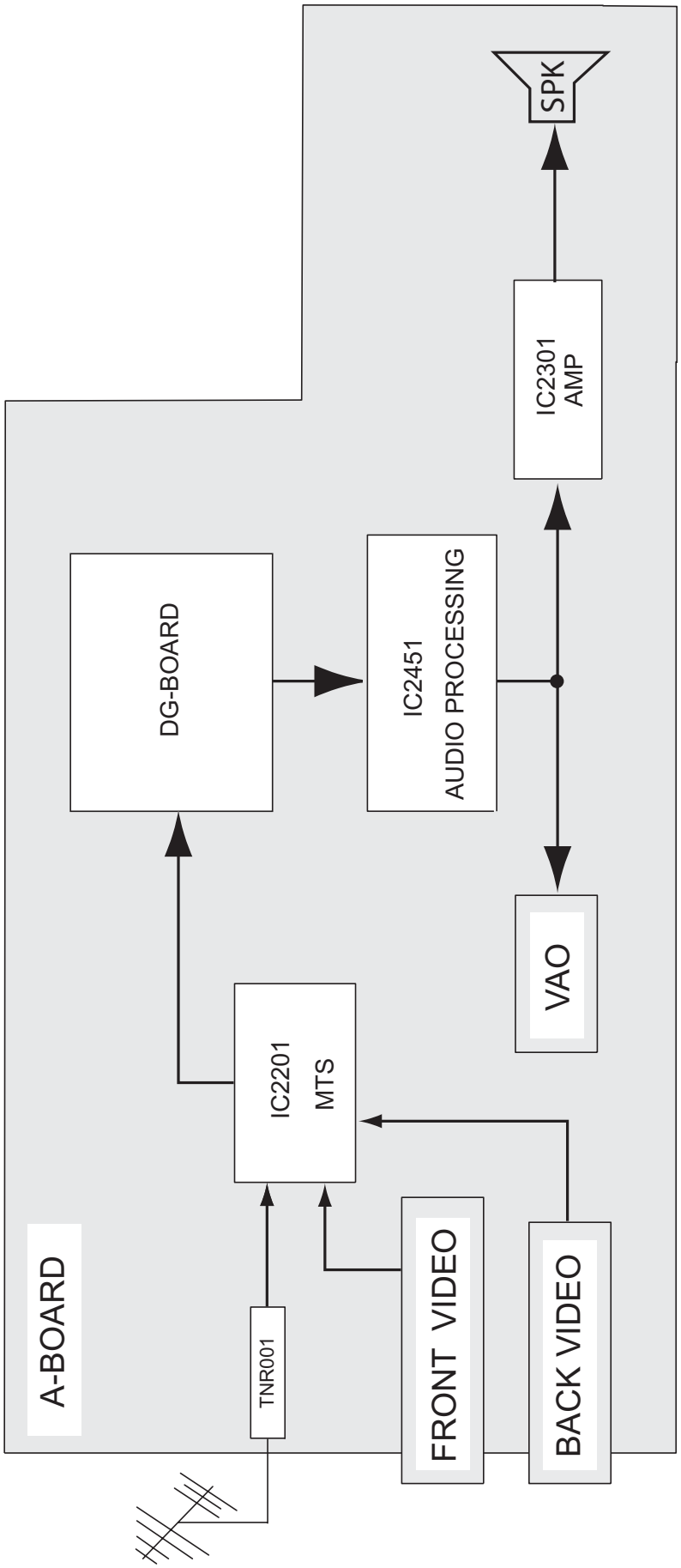
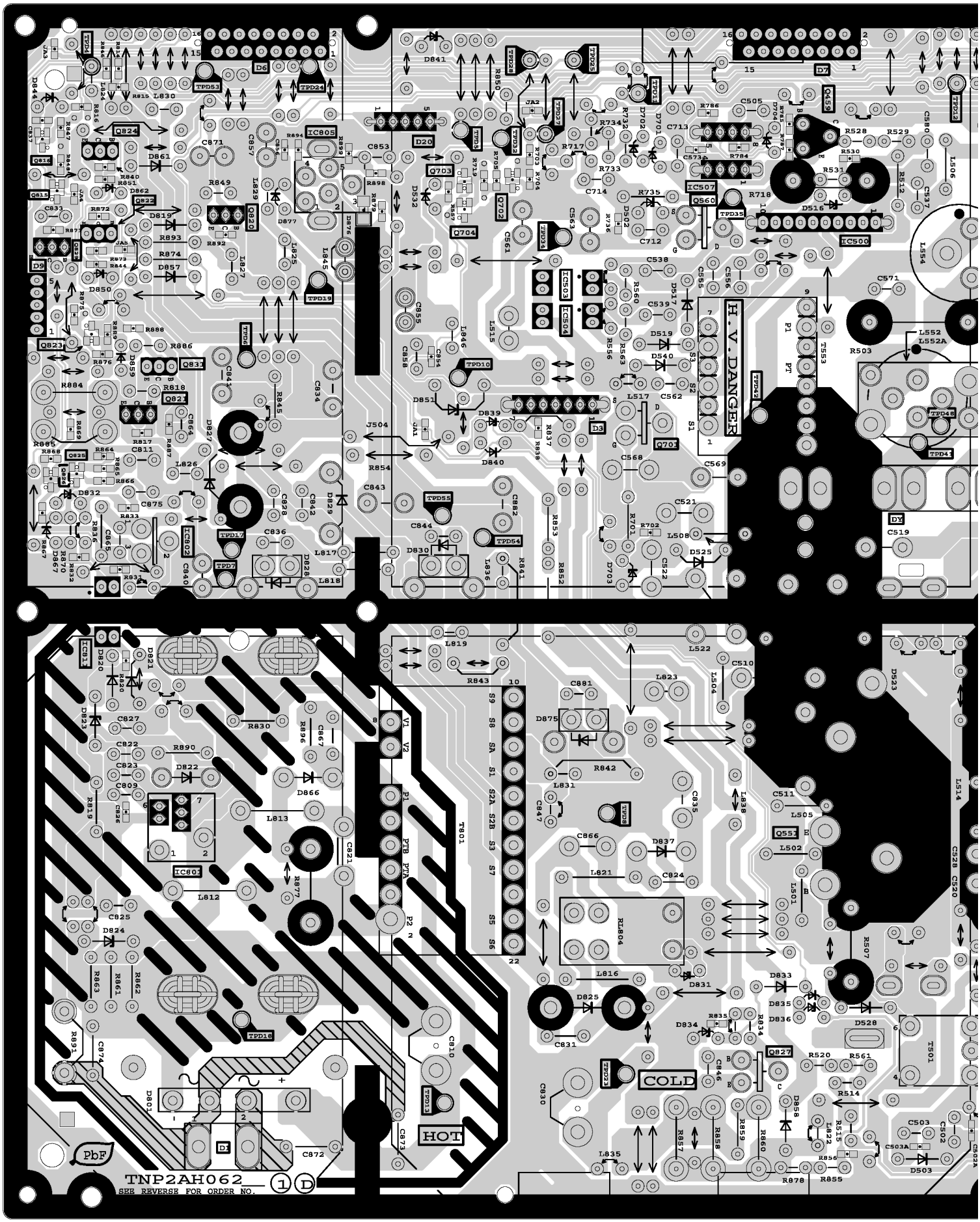
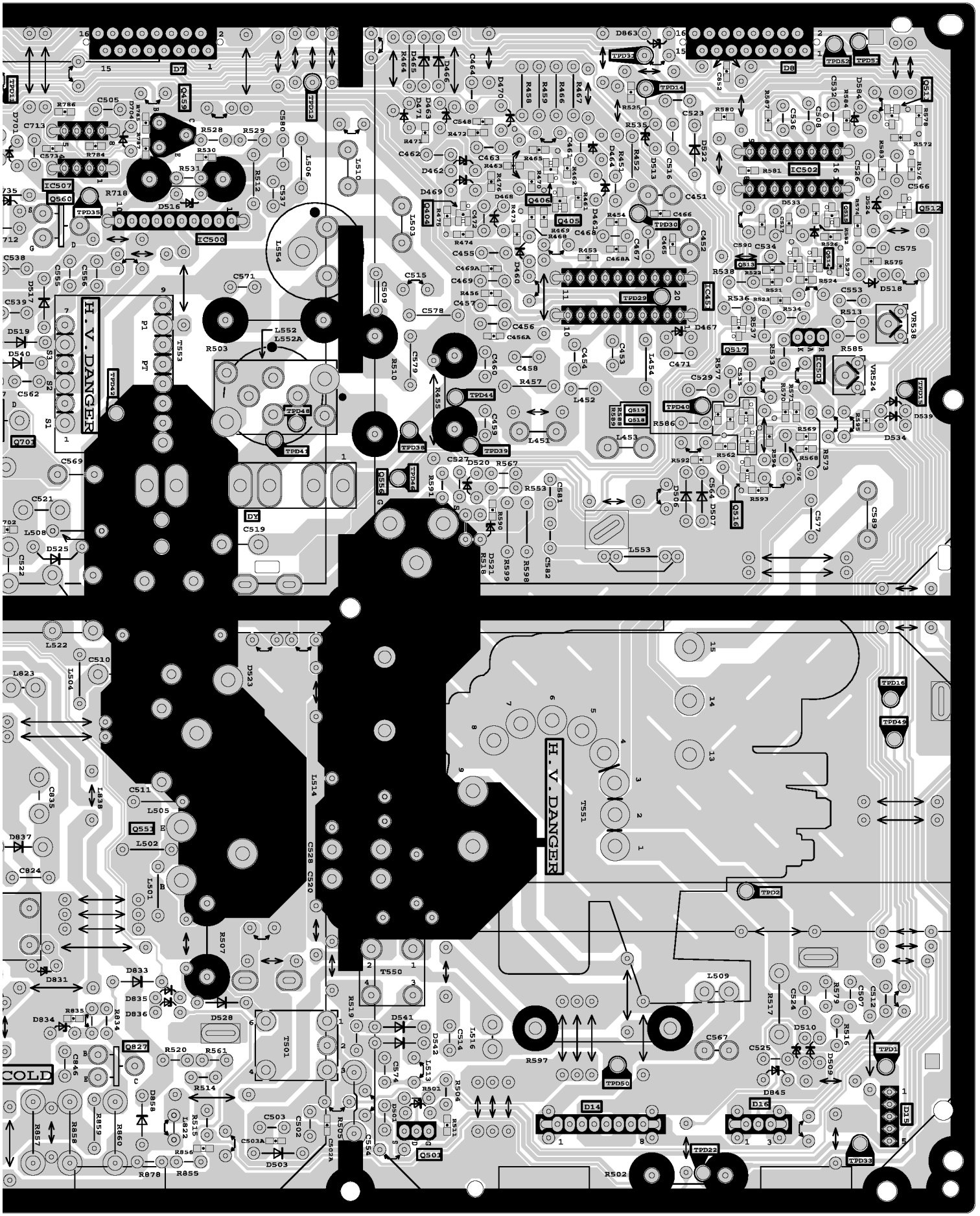


AUDIO BLOCK DIAGRAM CT-32HL44J/UJ


H.V.DANGER
COLD
HOT
TNP2AH062
SEE REVERSE FOR ORDER NO.
PbF



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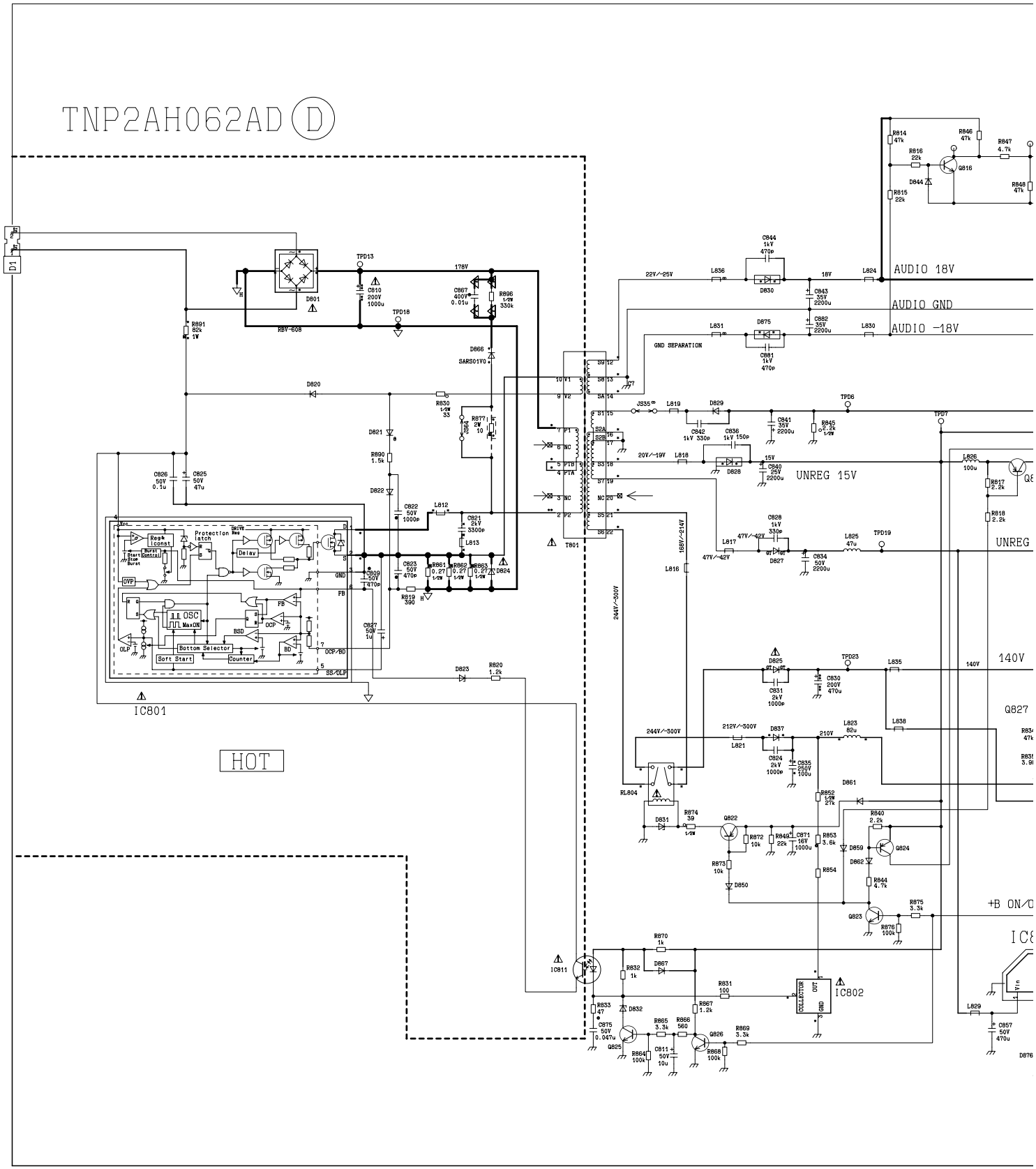
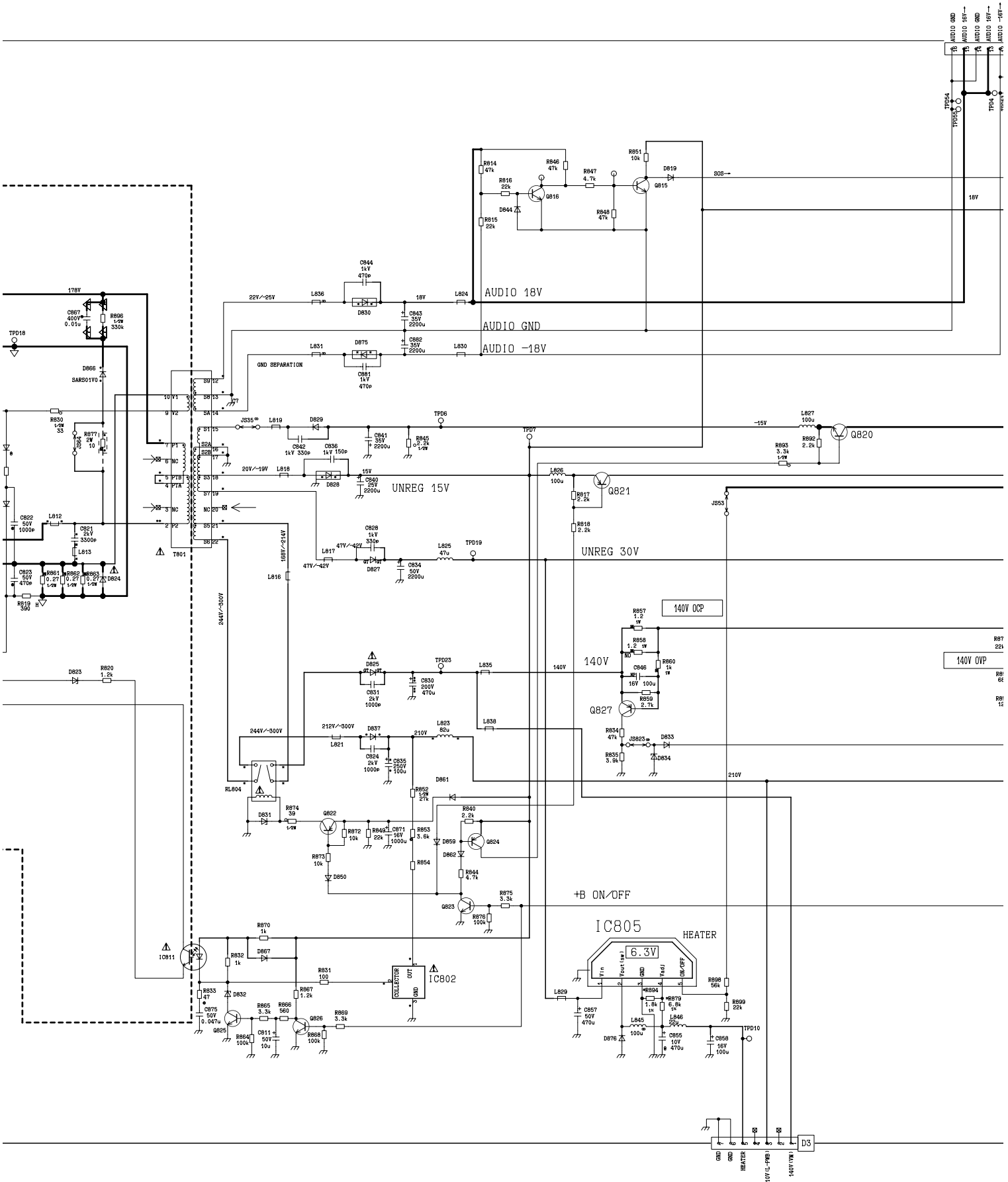
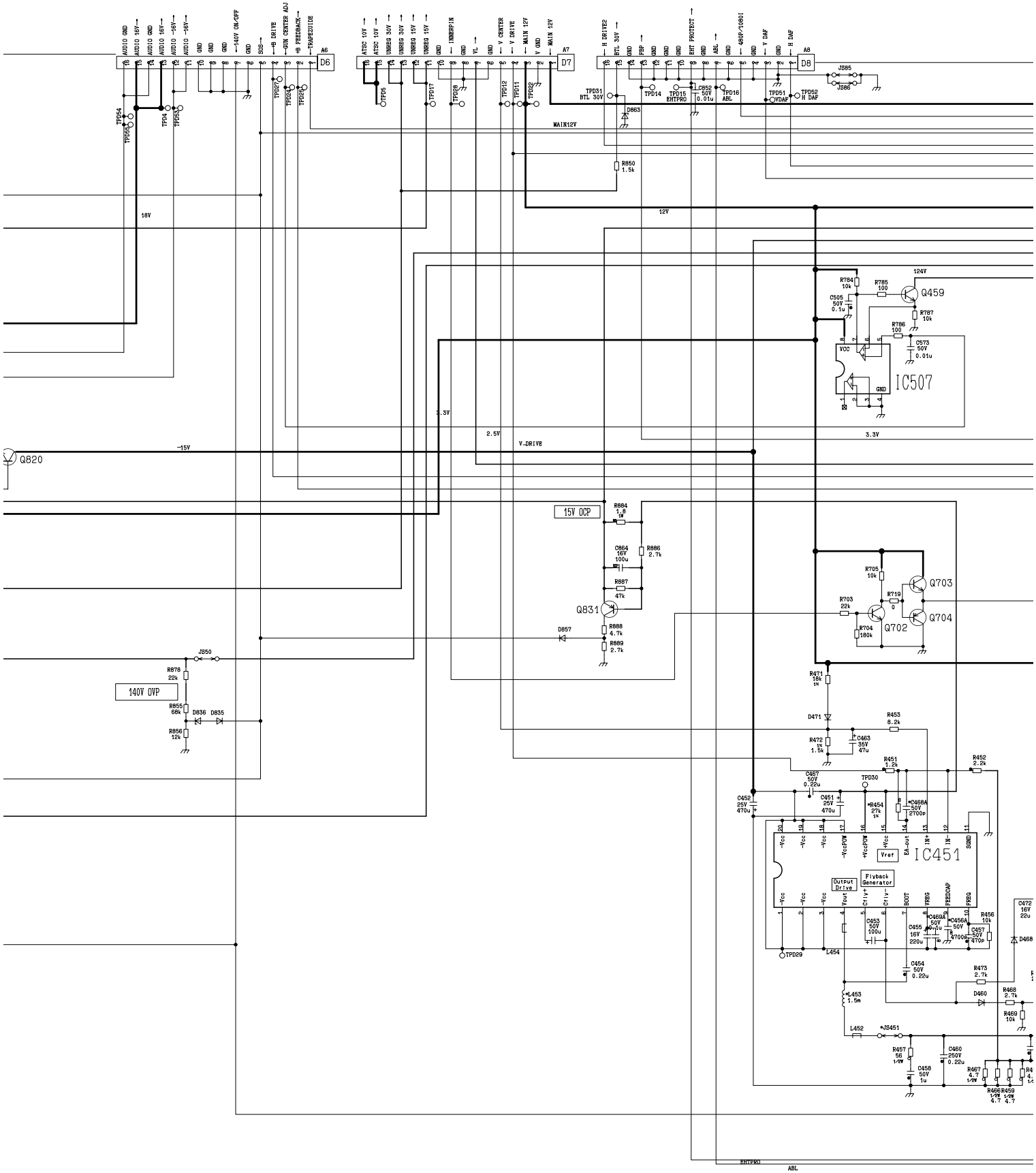
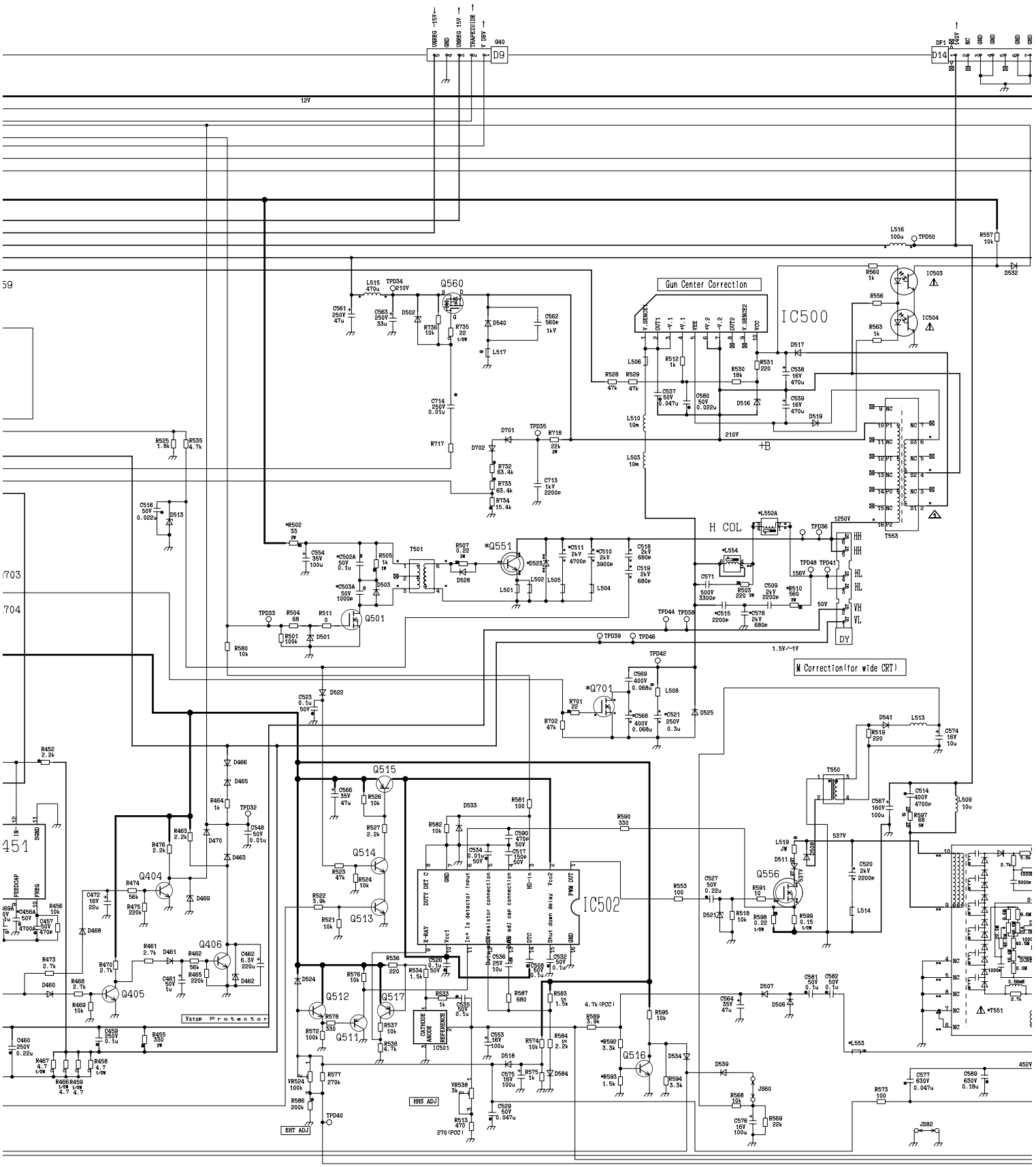
D-BOARD 2/2 TNP2AH062 CT-32HL44J/UJ


TNP2AH062AD D
AUDIO 18V
AUDIO GND
AUDIO −18V
UNREG 15V
UNREG
140V
HOT
IC801
IC802
IC811
T801
RL804
Q827
Protection latch
Regulator
Burst Control
Delay
OSC
MaxON
OVP
OLP
OCP
FB
BSD
BD
Bottom Selector
Soft Start
Counter
OCP/BD
SS/OLP
GND
GND SEPARATION
COLLECTOR
OUT
+B ON/O


AUDIO 18V
AUDIO GND
AUDIO -18V
UNREG 15V
UNREG 30V
140V OCP
140V OVP
+B ON/OFF
IC805
HEATER
6.3V
IC802
GND SEPARATION
T801
RL804
Q820
Q821
Q827
Q822
Q823
Q824
Q825
Q826
IC811


A6
D6
A7
D7
A8
D8
JS85
JS86
TPD31 BTL 30V
TPD14
TPD15 EHTPRO
TPD16 ABL
TPD51 VDAF
TPD52 H DAF
D863
MAIN12V
R850 1.5k
18V
12V
124V
R784 10k
R785 100
Q459
C505 50V 0.1u
R787 10k
R786 100
C573 50V 0.01u
VCC
GND
IC507
3.3V
2.5V
V-DRIVE
-15V
Q820
15V OCP
R884 1.8 1W
C864 16V 100u
R886 2.7k
R887 47k
Q831
D857
R888 4.7k
R889 2.7k
R705 10k
Q703
R719 0
R703 22k
Q702
Q704
R704 180k
JS50
R878 22k
140V OVP
R855 68k
D836
D835
R856 12k
R471 18k 1W
D471
R453 8.2k
R472 1% 1.5k
C463 35V 47u
R451 1.2k
R452 2.2k
C467 50V 0.22u
TPD30
C452 25V 470u
C451 25V 470u
*R454 27k 1%
*C468A 50V 2700p
IC451
Vref
Flyback Generator
Output Drive
C453 50V 100u
C455 16V 220u
*C469A 50V 4700p
*C456A 50V 4700p
C457 50V 470p
R456 10k
TPD29
L454
C454 50V 0.22u
R473 2.7k
D468
R468 2.7k
*L453 1.5m
D460
R469 10k
L452
*JS451
R457 5% 1/2W
C458 50V 1u
C460 250V 0.22u
R467 4.7 1/2W
R466 4.7
R459 1/2W 4.7
EHTPRO
ABL


Gun Center Correction
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IC502
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Q556
*Q551
*Q701
H COL
DY
+B
210V
1250V
1.5V/-1V
W Correction(for wide CRT)
Ystop Protector
EHT ADJ
HHH ADJ
T501
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T553
D9
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DF1
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TPD50
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D1000

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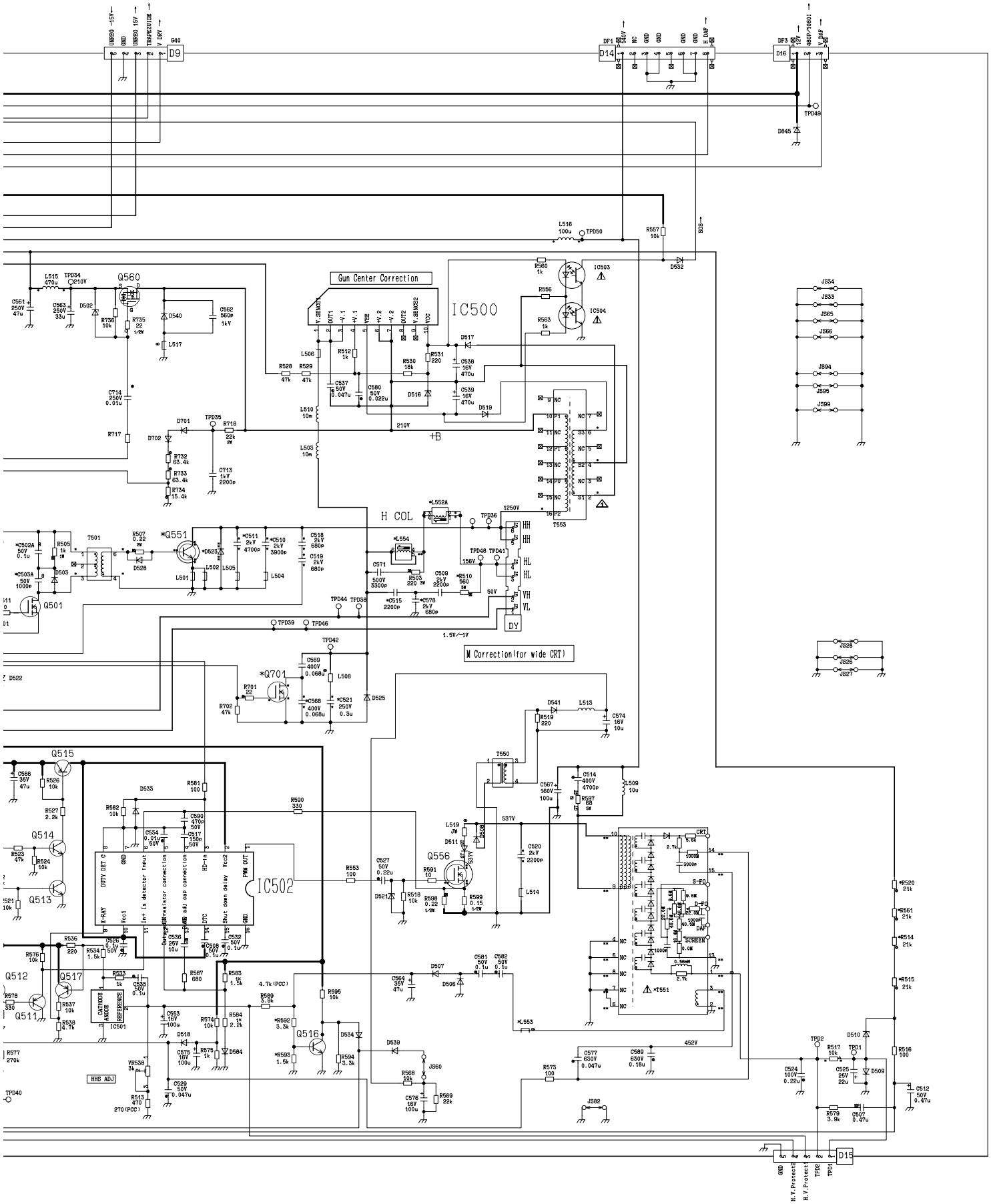
IC500
IC502
IC501
IC503
IC504
Gun Center Correction
H COL
M Correction(for wide CRT)
Q560
Q501
*Q551
Q515
Q514
Q513
Q512
Q517
Q511
Q516
Q556
*Q701
T501
T550
*T551
T553
D845
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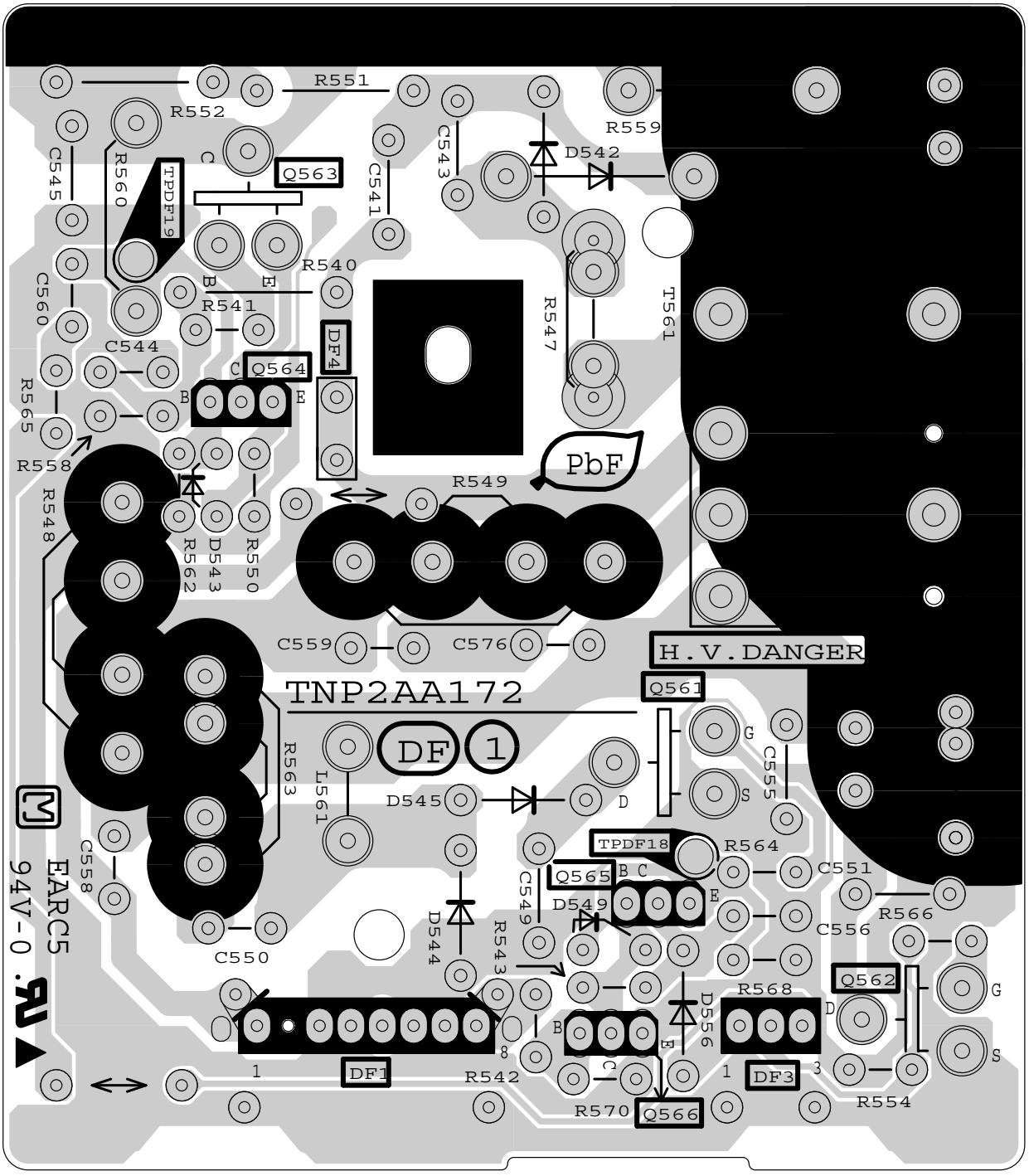
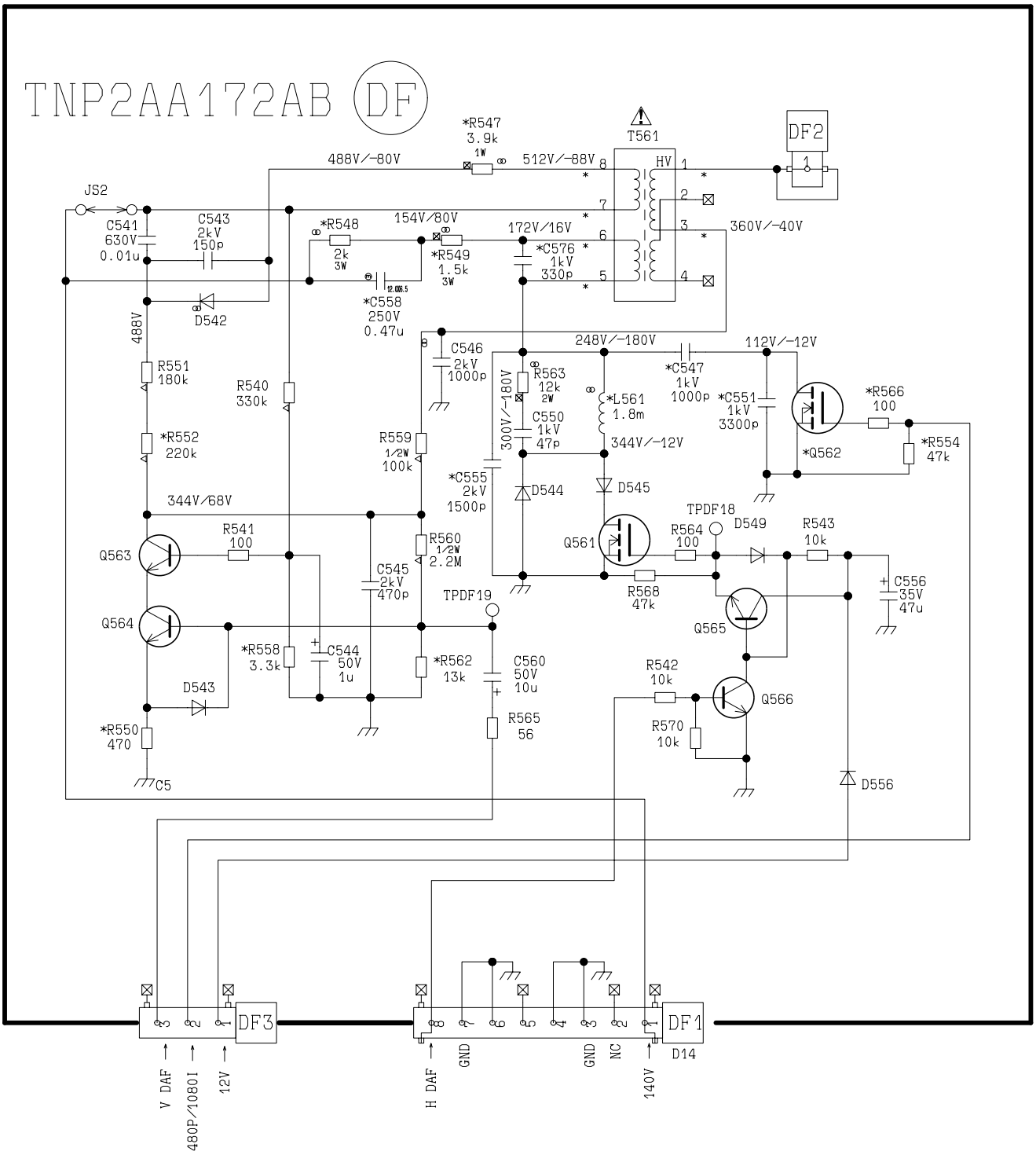
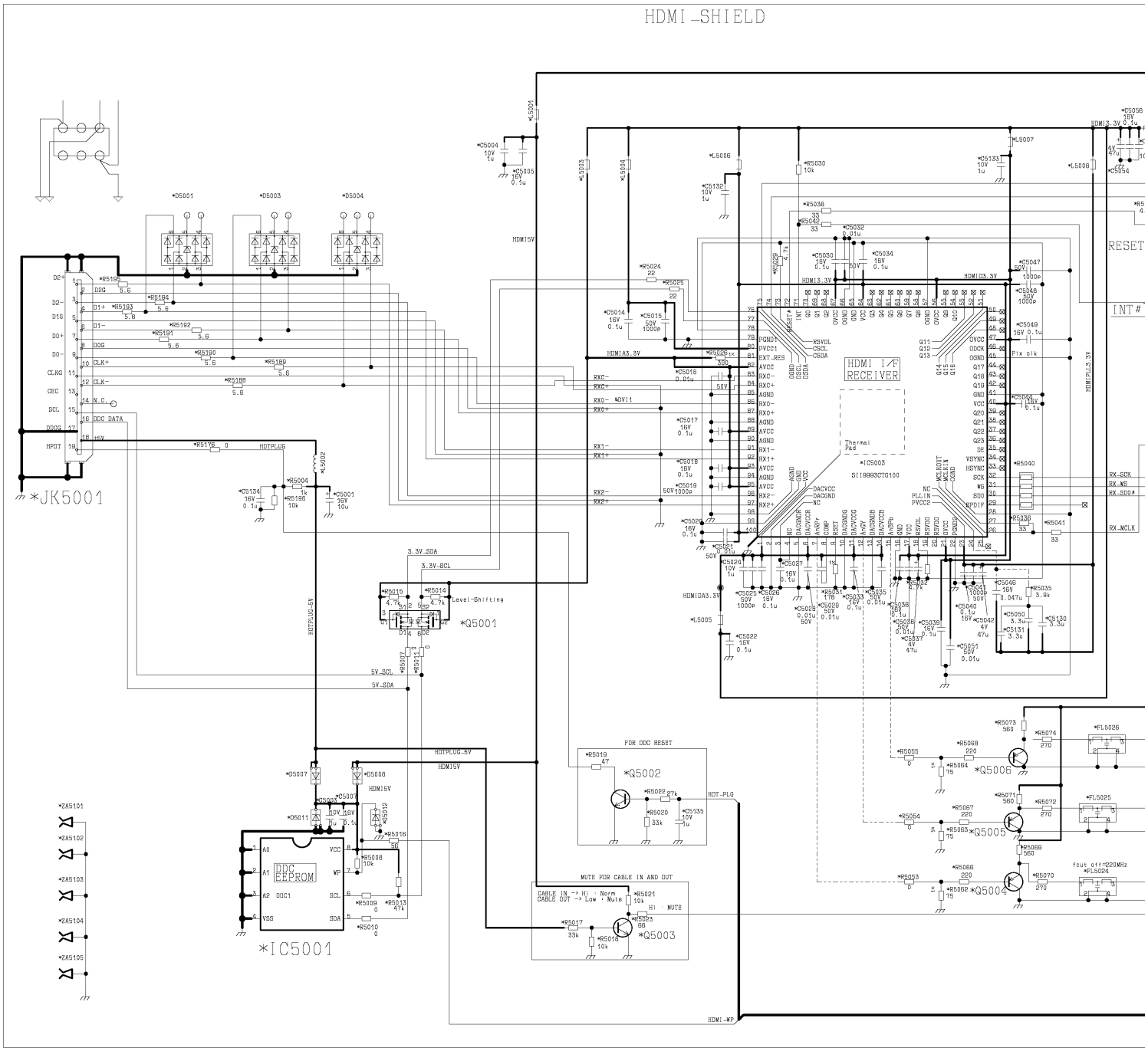
L501
L502
L505
L504
L508
L509
L513
L514
*L552A
*L554
*L553
TPD49
TPD50
TPD35
TPD36
TPD39
TPD40
TPD41
TPD42
TPD44
TPD46
TPD48
TPD38
TPD1
TPD2
VR536
JS60
JS82
JS28
JS26
JS27
JS34
JS33
JS65
JS66
JS94
JS95
JS99
D14
D16
D9
D15
DY
HHS ADJ
SCREEN
S-FO
D-FO
CRT
DAF
210V
+B
537V
452V
1.5V~1V
4.7k (PCC)
270 (PCC)
H.V Protect
GND
SDS

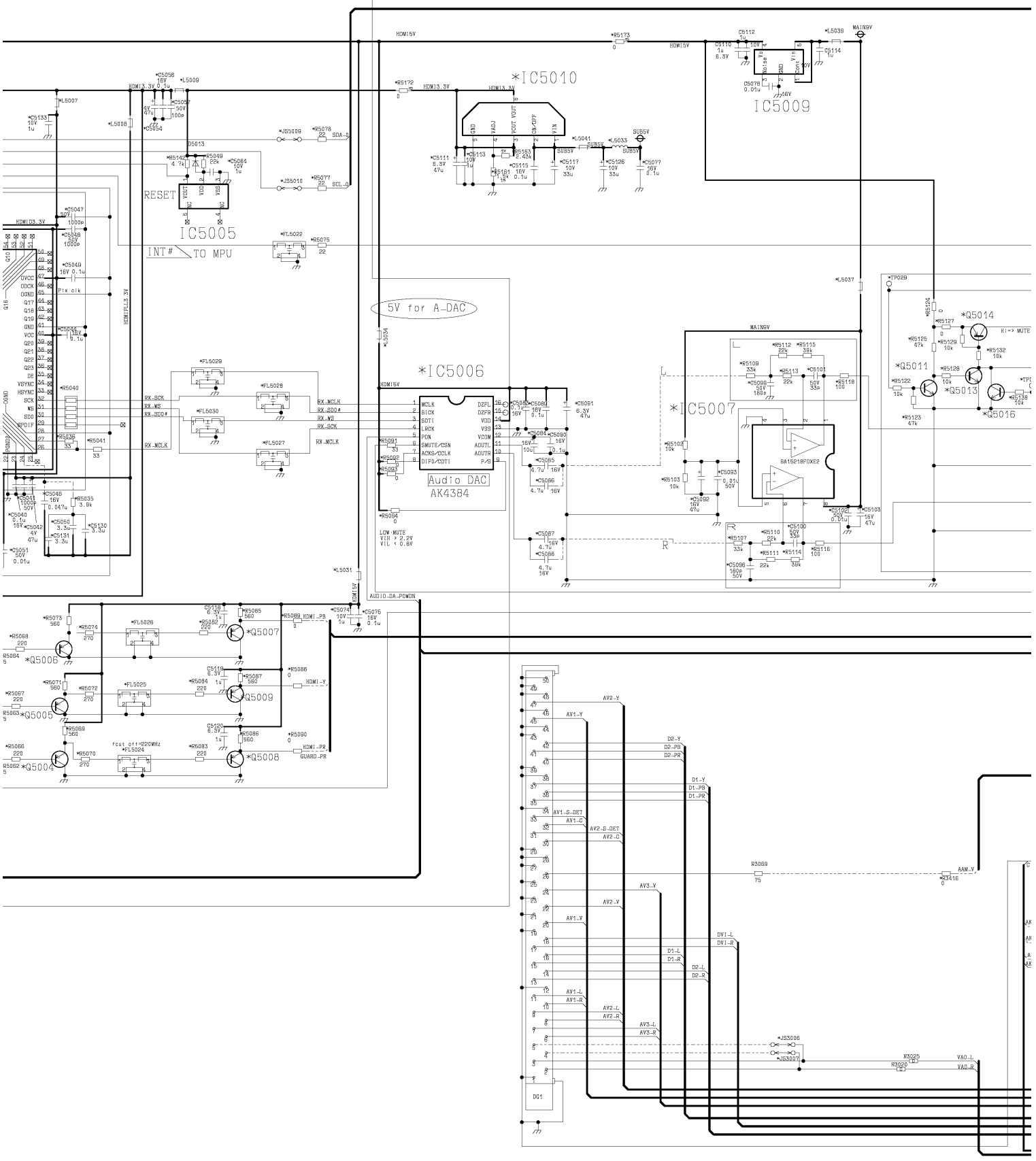
1	2	3	4	5	6	7	8

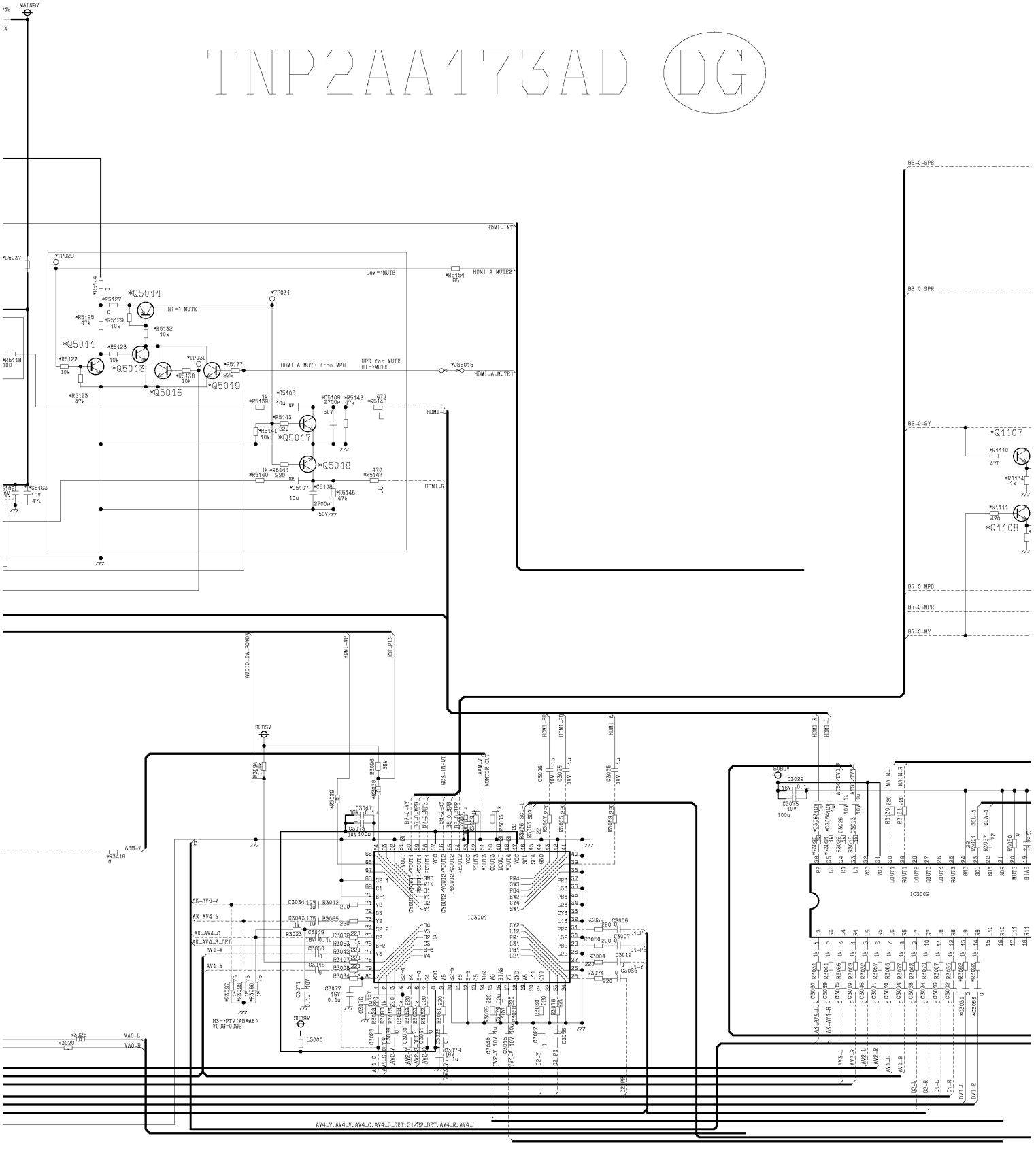

R551
R552
R559
C545
R560
TPDF19
C
Q563
C543
C541
D542
B
E
R540
R541
C560
C544
R547
T561
DF4
C
Q564
B
E
R565
R558
PbF
R549
R548
R562
D543
R550
C559
C576
H.V.DANGER
TNP2AA172
Q561
DF 1
G
S
C555
R563
L561
D545
D
TPDF18
R564
C551
Q565
B C
E
C549
D549
R566
C556
C558
C550
D544
R543
R568
Q562
G
D
S
D556
B
C
E
DF1
R542
DF3
R554
R570
Q566
EARC5
94V-0


TNP2AA172AB DF
*R547
3.9k
1W
T561
DF2
488V/-80V
512V/-88V
HV
JS2
C541
630V
0.01u
C543
2kV
150p
*R548
2k
3W
154V/80V
*R549
1.5k
3W
172V/16V
*C576
1kV
330p
360V/-40V
*C558
250V
0.47u
D542
488V
R551
180k
R540
330k
*R552
220k
C546
2kV
1000p
248V/-180V
*C547
1kV
1000p
112V/-12V
R563
12k
2W
300V/-180V
*L561
1.8m
C550
1kV
47p
344V/-12V
*C551
1kV
3300p
*R566
100
*Q562
*R554
47k
R559
1/2W
100k
*C555
2kV
1500p
D544
D545
344V/68V
TPDF18
D549
R543
10k
R541
100
Q563
R560
1/2W
2.2M
Q561
R564
100
C545
2kV
470p
TPDF19
R568
47k
C556
35V
47u
Q564
Q565
*R558
3.3k
C544
50V
1u
*R562
13k
C560
50V
10u
R542
10k
Q566
D543
R565
56
R570
10k
*R550
470
C5
D556
DF3
DF1
V DAF
480P/1080I
12V
H DAF
GND
GND
NC
D14
140V


HDMI_SHIELD
*JK5001
*IC5001
*Q5001
*Q5002
*Q5003
*Q5004
*Q5005
*Q5006
HDMI 1/F RECEIVER
Thermal Pad
SII9993CTG100
EEPROM
Level-Shifting
MUTE FOR CABLE IN AND OUT
FOR DDC RESET
HOT-PLG
HDMI15V
HDTPLUG
HDTPLUG-5V
5V-SCL
5V-SDA
3.3V-SDA
3.3V-SCL
HDMI_WP
RESET
INT#
RX-SCK
RX-WS
RX-SDO#
RX-MCLK
Pix clk

HDMI


*IC5010
IC5009
IC5005
RESET
INT#
TO MPU
5V for A-DAC
*IC5006
Audio DAC
AK4384
*IC5007
BA15218FOXE2
IC5001
HDMI3.3V
HDMI1.8V
HDMI5V
MAIN9V
SUB5V
AUDIO_DA_POWDN
RX_SCK
RX_WS
RX_SDO#
RX_MCLK
SDA_D
SCL_D
LOW-MUTE
VIH > 2.2V
VIL < 0.8V
*Q5004
*Q5005
*Q5006
*Q5007
*Q5008
Q5009
*Q5011
*Q5013
*Q5014
*Q5016
HDMI_Y
HDMI_PB
HDMI_PR
GUARD_PR
AV2_Y
AV1_Y
D2_Y
D2_PB
D2_PR
D1_Y
D1_PB
D1_PR
AV1_S_DET
AV1_C
AV2_S_DET
AV2_C
AV3_Y
AV2_V
AV1_V
DV1_L
DV1_R
D1_L
D1_R
D2_L
D2_R
AV1_L
AV1_R
AV2_L
AV2_R
AV3_L
AV3_R
AAM_Y
VAO_L
VAO_R
DG1


TNP2AA173AD DG
MAIN5V
*Q5014
*Q5011
*Q5013
*Q5016
*Q5019
*Q5017
*Q5018
HDMI-INT
HDMI-A-MUTE2
HDMI-A-MUTE1
HDMI-L
HDMI-R
HDMI A MUTE from MPU
HPD for MUTE
Low=>MUTE
Hi=>MUTE
*Q1107
*Q1108
SUB5V
IC3001
IC3002
AAM-V
AK-AV4-V
AK-AV4-C
AK-AV4-S-DET
AV1-V
AV4-Y,AV4-V,AV4-C,AV4-S-DET,S1/S2-DET,AV4-R,AV4-L

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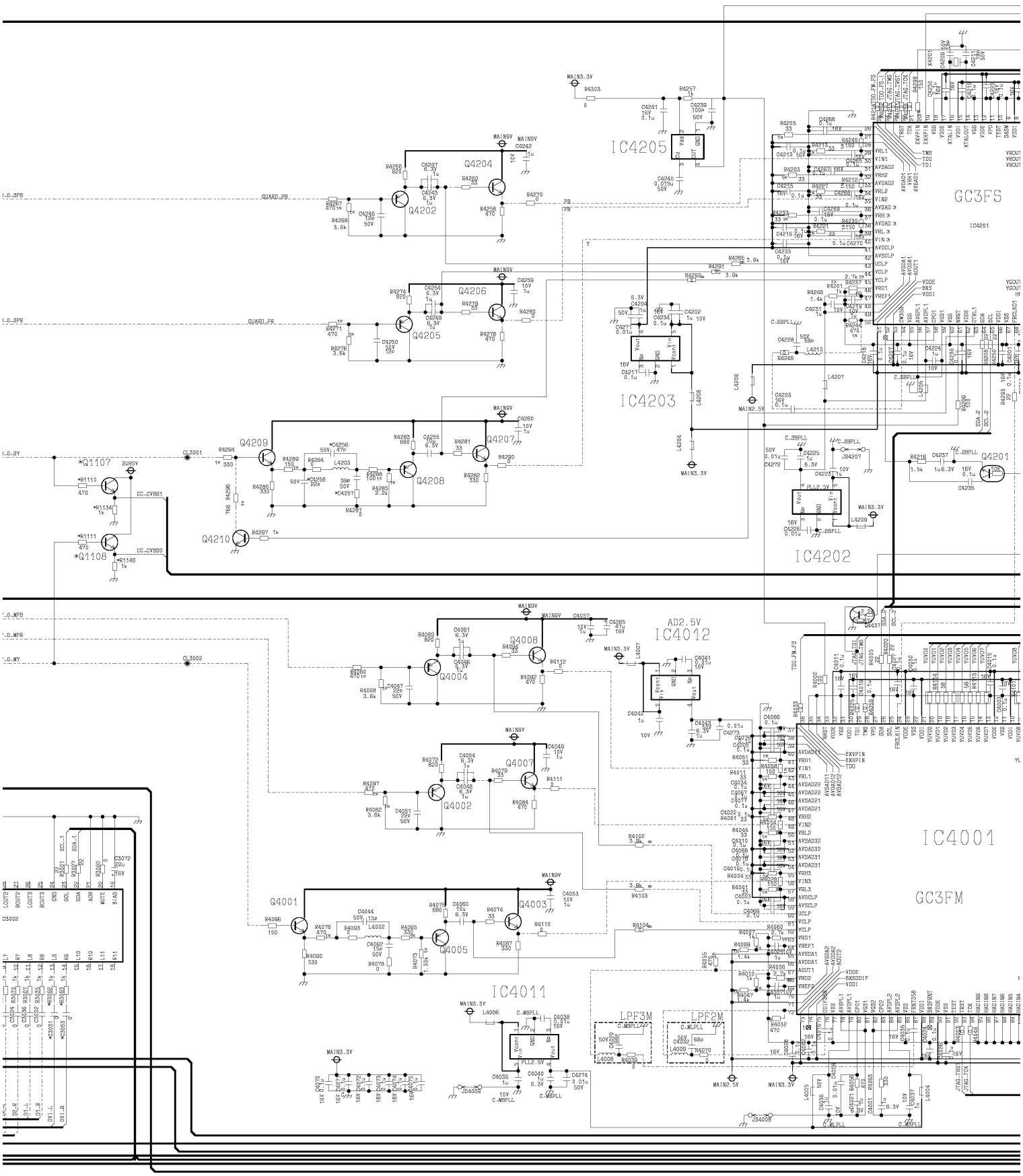
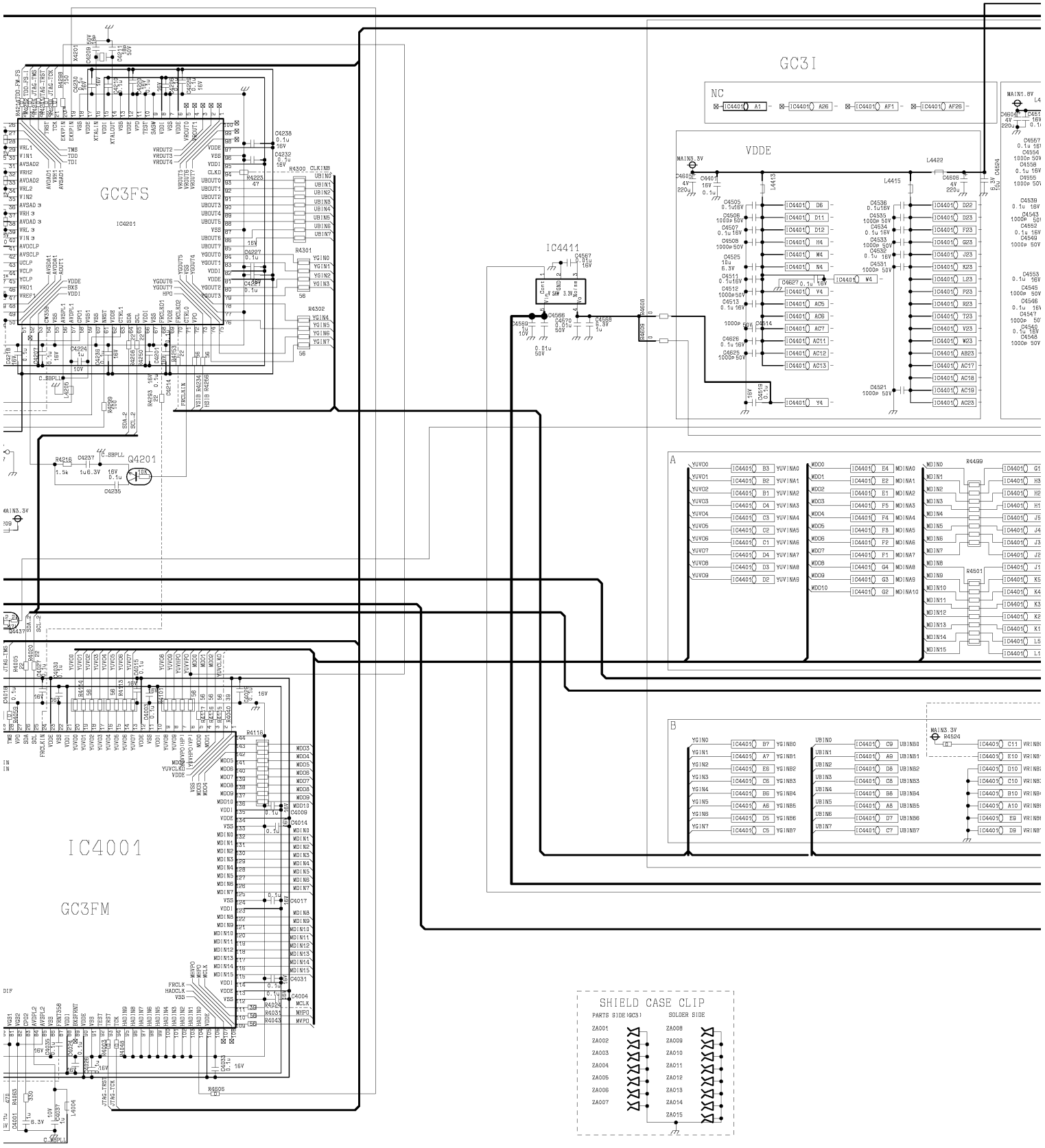
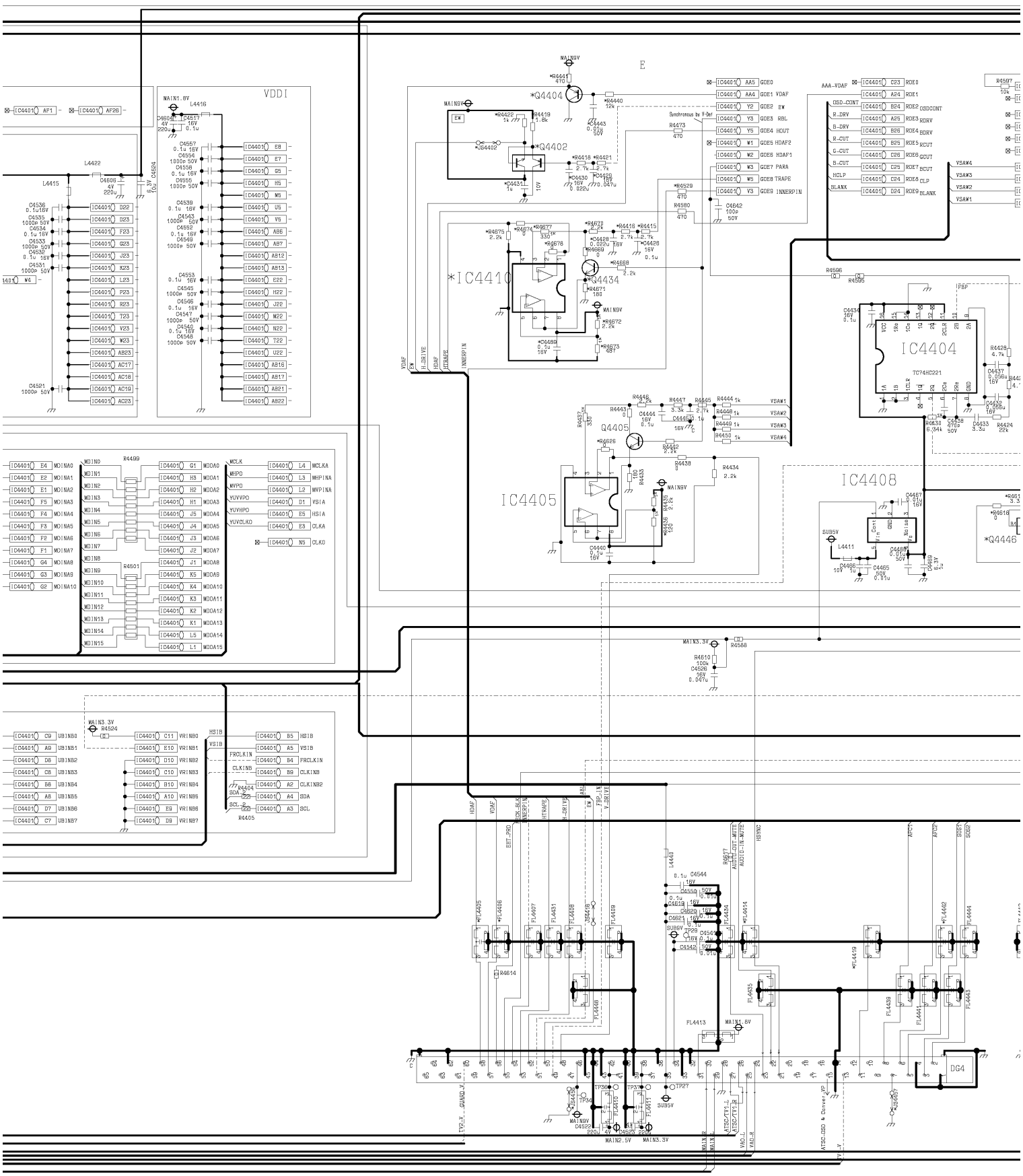

IC4205
IC4203
IC4202
IC4012
IC4001
IC4011
GC3FS
GC3FM
Q4204
Q4202
Q4206
Q4205
Q4209
Q4207
Q4208
Q4210
*Q1107
*Q1108
Q4004
Q4006
Q4007
Q4002
Q4001
Q4003
Q4005
Q4201
LPF3M
LPF2M
MAIN5V
MAIN3.3V
MAIN2.5V
SUB5V
PLL2.5V
AD2.5V
I-D-SPB
I-D-SPR
I-D-SY
I-D-MPB
I-D-MPR
I-D-MY
GUARD_PB
GUARD_PR
CC_CVBS1
CC_CVBS0
CL3001
CL3002
C-SBPLL
C-MBPLL
JS4207
JS4009
JS4008

1	2	3	4	5	6	7	8


GC3FS
IC4201
GC3FM
IC4001
GC3I
VDDE
IC4411
SHIELD CASE CLIP
PARTS SIDE(GC3I)
SOLDER SIDE


VDDI
MAIN1.8V
MAIN5V
MAIN3.3V
MAIN2.5V
SUB5V
IC4404
IC4405
IC4408
*IC4410
*Q4404
*Q4402
Q4405
*Q4434
*Q4446
IC4411
TC74HC221
DG4
E
F
MCLK
WHPO
WVPO
YUVVPO
YUVHPO
YUVCLKO
HSIB
VSIB
FRCLKIN
CLKINB
SDA
SCL
HDAF
VDAF
FLDRIVE
HTRAPE
VTRAPE
INNERPIN
EW
R-DRV
G-DRV
B-DRV
R-CUT
G-CUT
B-CUT
HCLP
BLANK
OSD-CONT
AAA-VDAF
VSAW1
VSAW2
VSAW3
VSAW4
CLKO
CLKA
MCLKA
MHPINA
MVPINA
VSIA
HSIA

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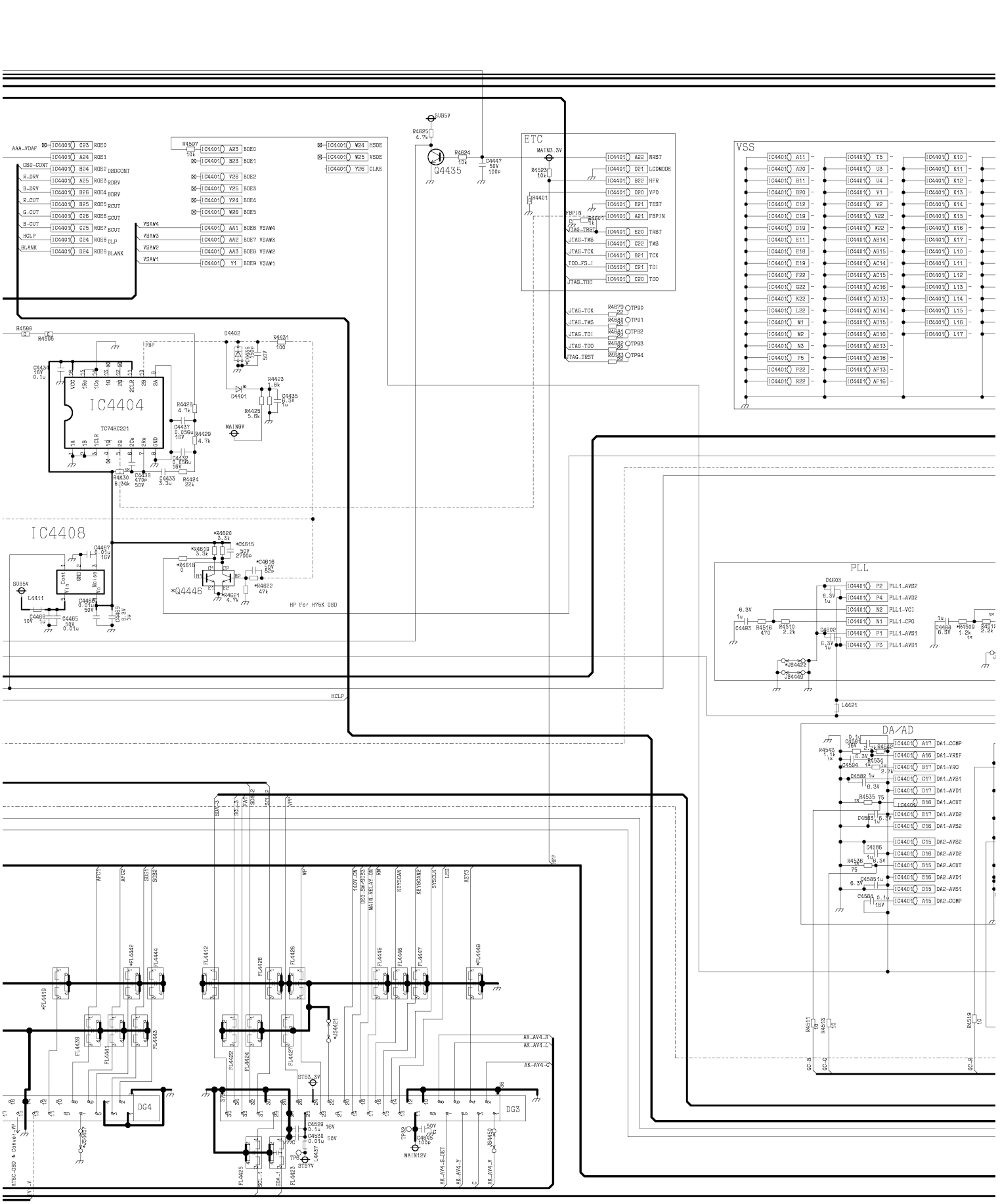
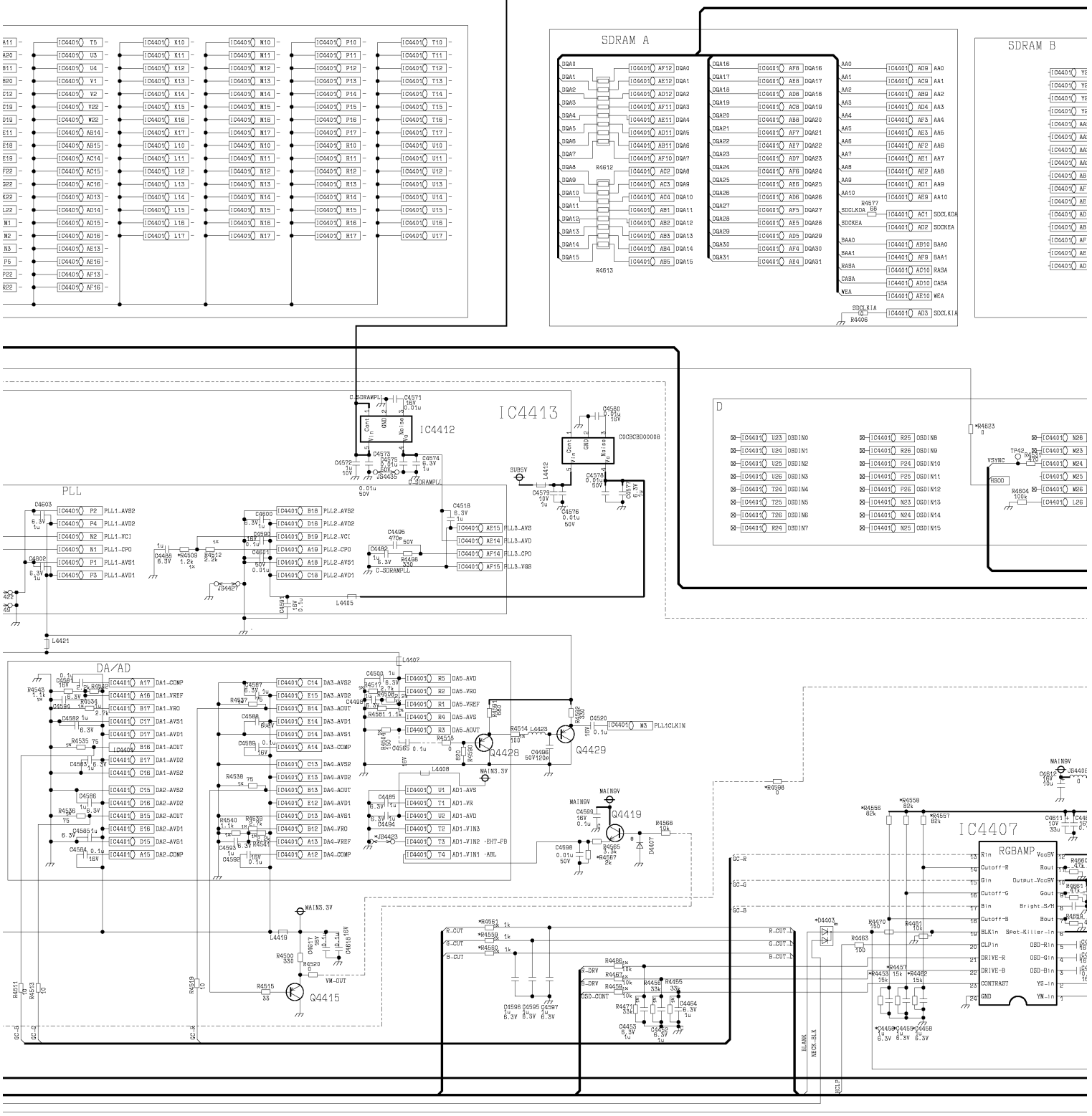
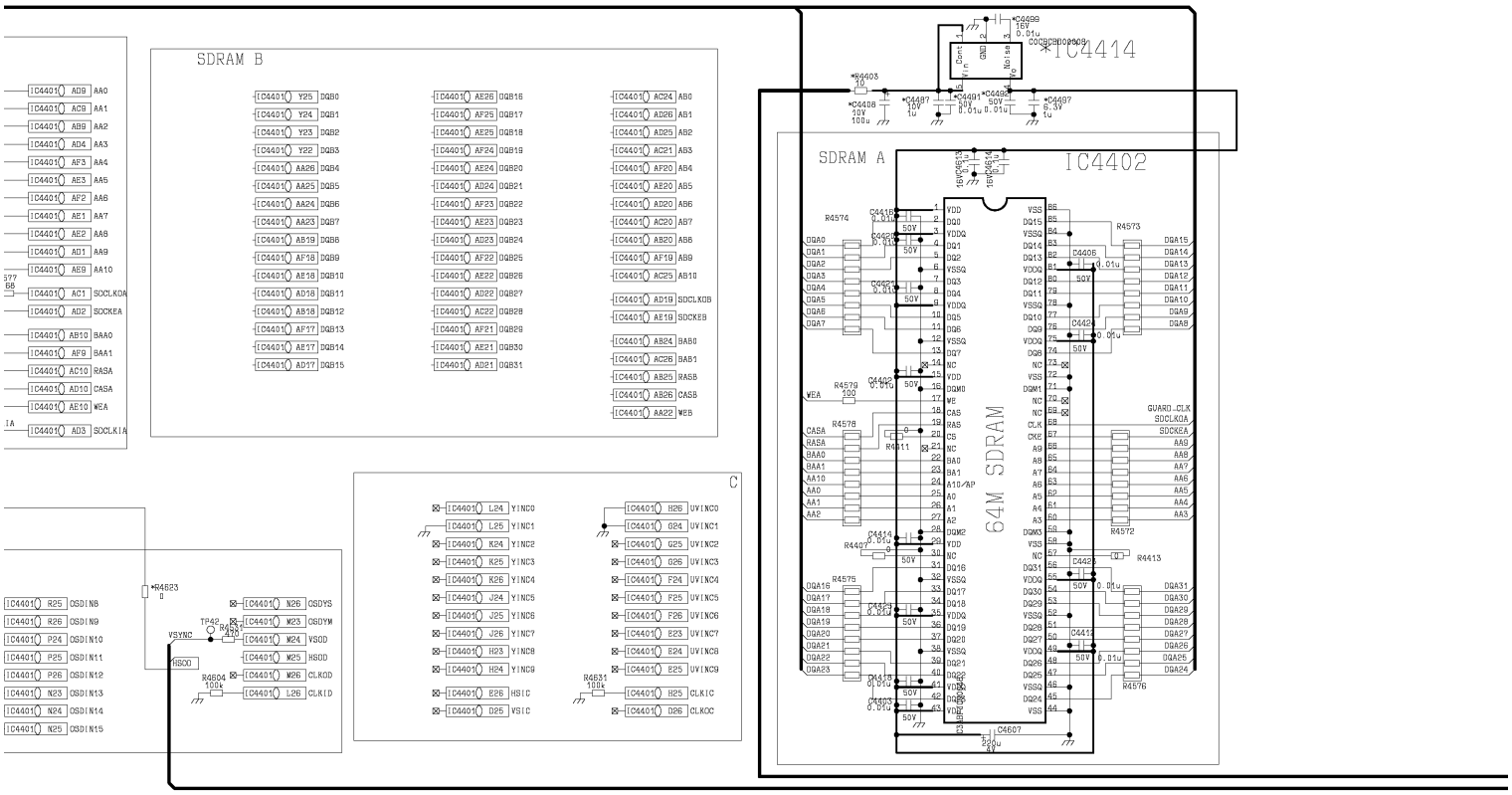
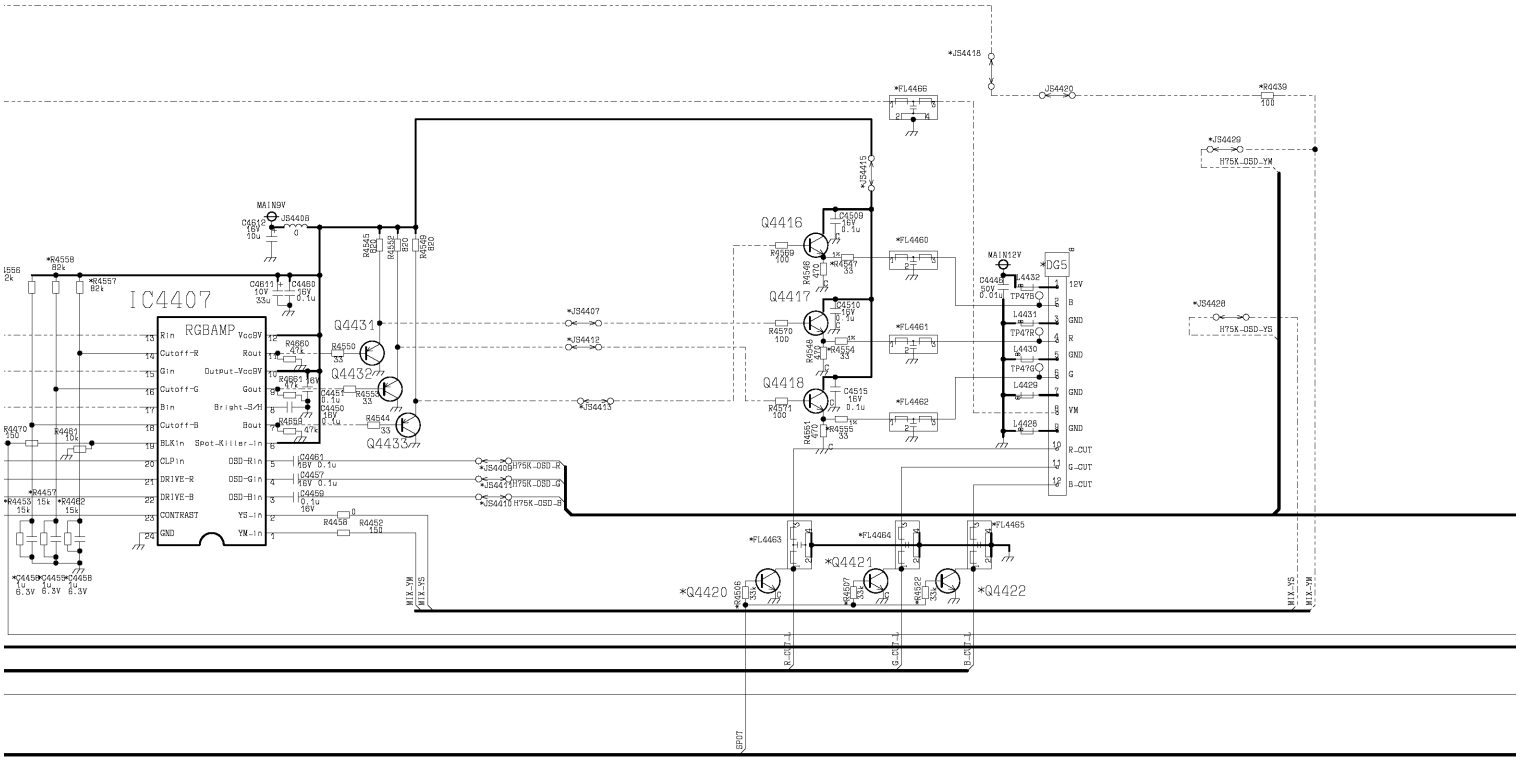

IC4404
TC74HC221
IC4408
Q4446
Q4435
Q4401
ETC
VSS
PLL
DA/AD
DG4
DG3
HP For H75K OSD
ATSC-OSD & Conver_VP
MAIN12V
MAIN9V
SUB5V
MAIN3.3V
STB3.3V
STB7V


SDRAM A
SDRAM B
IC4412
IC4413
PLL
DA/AD
IC4407
RGBAMP
Q4428
Q4429
Q4419
Q4415


SDRAM B
SDRAM A
IC4402
IC4414
64M SDRAM


IC4407
RGBAMP
MAIN9V
MAIN12V